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BUREAU OF MINES ★ UNITED STATES DEPARTMENT OF THE INTERIOR

Minerals and Materials

A Bimonthly Survey

October/November 1982

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UNITED STATES DEPARTMENT OF THE INTERIOR
James G. Watt, Secretary

BUREAU OF MINES
Robert C. Horton, Director

FOREWORD

Significant actions were taken by the world metal industries during the months of September and October to meet domestic and foreign competition. Both the United States and the European Economic Community (EEC) took steps to prevent unfair competitive practices in world trade; the EEC countries sought to rationalize their steel industrial sector; and many nations strove to assist their minerals and materials industries with government aid, including measures that would limit foreign competition. The mineral highlights sections of this issue are therefore replete with actions directly related to the condition of the steel, aluminum and other metals industries of the major producing nations. Mineral highlights are selected for inclusion on the basis of their significance to U.S. and world mineral markets.

To probe into some of the underlying reasons for the present condition of the mineral industry, the economic analysis presented in this issue examines U.S. demand conditions and the level of interest rates and productivity. It concludes that while soft demand conditions and the high real interest rate level during the current recession are major constraints to restoring the viability of the minerals industry, a poor productivity performance by the U.S. minerals and materials industries during the past five years may be a myth. Analysis of the data series shows that three of the major minerals sectors, including two metal industries, have performed better than the economy as a whole during the 1977-81 period. In future issues, the productivity issue will be examined in greater detail. Finally, beginning with this issue, the mineral data series graphs and tables will be presented in a new format to facilitate a better understanding of recent trends in major mineral markets.

The Editor

Acknowledgments

Economic analyses in this publication are developed by the Minerals and Materials staff. Mineral information and data are provided by the commodity and foreign area specialists of the Minerals Information Assistant Directorate and the state liaison officers of the Mineral Data Analysis Assistant Directorate.

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THE PERFORMANCE OF THE U.S. MINERAL INDUSTRY

This section of Minerals and Materials analyzes the following three factors affecting the recent performance of the U.S. and world mineral industries: 1) the health of the U.S. and world economies, 2) the level of interest rates and 3) the performance of productivity in both the U.S. mineral industry and the general economy. While these indicators do not exhaust the possible critical factors, they represent an initial attempt to probe some of the considerations underlying the performance of the U.S. minerals and materials industry.

The U.S. and World Economies

It is essential to analyze the state of the U.S. and world economy because the demand for minerals and materials is a derived demand; that is, since minerals and materials are used in the productive process, the demand for them is a direct function of the demand for the finished products of which they are a basic input. Thus, the demand for minerals and materials is directly affected by changes in present and planned consumption and investment expenditures. The past two issues of this publication have highlighted the generally discouraging performance of the national and international economies. Briefly, the world economy is in the third year of the first long recession in recent history where inflation rates have remained above 5 percent. With many countries either unable or unwilling to support domestic spending while inflation continues, there has been a growing tendency to institute trade-restrictive policies to support domestic demand. The resulting weakened demand conditions in exporting nations have had a direct effect on the mineral industry.

Turning to the U.S. economy during the third quarter of 1982, the annual growth rate of real Gross National Product (GNP), real gross private investment and consumer durable expenditures declined compared to the second quarter (Table 1). Factory orders for manufactured goods, of vital importance to the minerals and materials industries, declined 3.9 percent in October, the sharpest decline in a year. Given this performance, it is not surprising that materials production and capacity utilization in the industrial materials industry have declined every month since February 1982 (Table 2).

The Level of Interest Rates

The interest rate is the price of capital, the cost a firm must meet in order to obtain debt and equity capital. Changes in the interest rate can thus play an important role in determining the economic viability of the minerals and materials industries. Major declines in market interest rates have taken place during the past six months. The discount rate, for example, has been lowered from 12 percent in May to 9.0 percent in November and the prime interest rate charged by banks on short-term business loans fell from 12.5 percent in October to 11.5 percent at the end of November. However, the overall economic impact of these considerable interest rate declines, which lower debt, equity and inventory carrying costs of industry, appears to be confined to the housing and construction industries.1/ One reason for the continued

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1/ Board of Governors of the Federal Reserve System. Federal Reserve Bulletin. November 1982, page A50. Based on the September rate, housing starts for 1982 are estimated at 1,146,000, compared to 1,084,000 in 1981. New housing starts increased 26.5 percent from October to November to a 22-month high.

TABLE I

Selected National Income and Product Accounts
(Percent Change at Annual Rates)

	1981	1982		
	IV	I	II	III
Real Gross National Product	-5.3	-5.1	2.1	0.8
Real Personal Consumption Expenditures	-3.3	2.5	2.5	1.4
Consumer Durable Expenditures	-20.9	10.4	2.5	-4.3
Real Gross Private Domestic Fixed Investment	-5.0	-6.0	-7.6	-9.8
Government Purchase of Goods and Services	7.0	-2.9	-5.3	6.8
Changes in Business Inventories	-0.8	-1.1	0.4	-0.7

Source: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. October 1982, p. 1.

TABLE 2

Production and Capacity Utilization Indexes

Seasonally Adjusted
(1967 = 100)

	1979	1980	1981	1982									
				Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.
Production													
Industrial	152.5	147.0	151.0	140.7	142.9	141.7	140.2	139.2	138.7	138.8	138.4	137.4	136.3
Materials	156.4	147.6	151.6	137.2	140.4	138.5	136.2	134.3	133.5	133.0	133.0	132.0	131.2
Capacity Utilization 1/													
Manufacturing	85.7	79.1	78.5	71.1	72.2	71.6	70.8	70.2	70.0	70.0	69.8	69.2	68.4
Industrial Materials Industries	87.4	80.0	79.9	71.4	72.9	71.8	70.5	69.4	68.8	68.5	68.4	67.7	67.2

1/ Ratios of indexes of production to indexes of capacity, in percent.

Source: Board of Governors of the Federal Reserve System. Federal Reserve Bulletin. October and November 1982, p. A46.

weak performance of other sectors in the economy is that although interest rates are declining, the present level of the real rate remains exceedingly high compared to the levels of the 1970's. For example, the federal funds rate of interest in September 1982 was 9.7 percent.[2] Adjusting this rate for inflation by using the third-quarter value of the Gross National Product (GNP) fixed weighted price index[3] gives a real or inflation-adjusted rate of interest in September of more than 3 percent. At a comparable stage in the 1975 recession, this same interest rate was a negative rate of three percentage points. The real interest rate for 30-day Treasury bills in 1981-82 is 4.85 percent and 7.5 percent in the third quarter of this year. Given such a high positive real interest rate and weak domestic and international demand, there simply has not been sufficient incentive for capital investment and inventory replenishment by consumers of minerals and materials.

Productivity in the U.S. Business Sector

Productivity, or output per unit of input, is a measure of the productive efficiency of the economy.[4] From 1947 to 1977, productivity in the U.S. nonfarm private economy increased at an annual rate of 2.4 percent. Since 1978, productivity in both the total business and nonfarm business sectors has been decreasing slightly, except from 1980 to 1981 when it increased 1.4 percent in the nonfarm business sector and 1.8 percent in the total business sector. In the first half of 1982 productivity again increased slightly, although it has still not reached its 1977 level (Table 3). Since workers' compensation, including fringe benefits, increased at a higher rate than prices in 1981, real compensation costs increased during this year.[5] Increments in output did not compensate for these real cost increases, therefore real labor costs per unit of output increased. Though pressures were placed on output prices, firms facing strong domestic and foreign competition and soft demand conditions could not pass the rising unit costs on in the form of higher product prices. Layoffs, shutdowns, relocations, technological changes and substitution of less for relatively more expensive factors characterized many of these industries. To further reduce costs and meet competition, management has sought governmental assistance and changes in job rules and contracts to an increasing degree, and workers have shown a growing willingness to discuss and accept some changes. (See pp. 22 and 23 of this issue.) Thus, the rising real unit labor costs during 1981 adversely affected the competitive position of U.S. industry.

Because of the adjustments which the economy has been going through in the past few years, aggregate hours of employment in the U.S. business economy have declined at a higher annual rate based on third-quarter data (2.7 percent) as compared to the previous quarter (0.8 percent). Since gross output showed a slight increase during this period, productivity, as measured by gross output over employment hours, increased at an annual rate of 3.5 percent, which, if continued, would

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2/ Page A3 of work cited in footnote 1. The federal funds rate is that charged by member banks of the Federal Reserve System to other member banks.

3/ U.S. Department of Commerce. Survey of Current Business. October 1982, page 2.

4/ The most commonly used measure of productivity is gross domestic output in 1972 dollars divided by the hours of all persons engaged in the sector, including hours of proprietors and unpaid family workers.

5/ Compensation increased about 10 percent in 1981 while prices, as measured by the GNP price deflator, increased 8 percent.

TABLE 3

Productivity Indexes[1/]

(1977 = 100)

Year	Output per Hour of All Persons: Business Sector	Output per Hour of All Persons: Nonfarm Business Sector	Total Mining: Fuel and Nonfuel	Copper Ore Mining (crude ore)	Iron Ore Mining (crude ore)	Nonmetallic Minerals Mining (except fuels)	Total Coal Mining
1969	85.5	86.5	124.3	77.9	99.7	86.9	144.7
1970	86.2	86.8	129.7	84.8	99.9	89.7	141.1
1971	89.2	89.7	129.8	86.6	98.6	89.1	129.5
1972	92.4	93.0	129.0	91.8	108.0	92.6	124.4
1973	94.7	95.3	127.6	92.0	113.2	97.2	125.5
1974	92.5	92.9	118.9	85.7	107.9	93.6	122.5
1975	94.5	94.7	108.4	87.2	112.7	90.6	105.3
1976	97.6	97.8	103.2	99.2	113.5	96.2	103.1
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	100.6	100.6	98.2	109.6	116.8	104.6	106.4
1979	99.6	99.3	91.6	103.8	125.5	102.4	99.4
1980	98.9	98.5	87.3	100.3	129.0	96.3	112.5
Qtr. III	98.9	98.4	-	-	-	-	-
Qtr. IV	99.3	99.2	-	-	-	-	-
1981	100.7	99.9	81.4	100.6	138.3	97.9	122.9
Qtr. I	100.7	100.4	-	-	-	-	-
Qtr. II	100.7	100.0	-	-	-	-	-
Qtr. III	101.0	100.0	-	-	-	-	-
Qtr. IV	100.2	99.1	-	-	-	-	-
1982							
Qtr. I	100.0	99.2	-	-	-	-	-
Qtr. II	100.3	99.3	-	-	-	-	-

1/ Output refers to gross domestic product originiating in the sector in 1972 dollars. Hours refer to hours of all persons in private industry engaged in sector, including hours of proprietors and unpaid family workers.

Sources: Council of Economic Advisers. Economic Indicators. October 1982, p. 16.
U.S. Department of Labor, Bureau of Labor Statistics. (Unpublished productivity data.)

strengthen the competitive position of U.S. firms in the world market.[6] Again, it is important to note that this productivity increase reflects cyclical adjustments, including the substitution of capital for labor and the conservation of labor in the production process.

U.S. Mining Industry Productivity

A charge often made is that the U.S. nonfuel mining industry is relatively inefficient and therefore a major factor underlying its present difficulties is poor productivity performance. An examination of the evidence indicates that this charge is unfounded. Although productivity in the total U.S. mining industry, including both fuel and nonfuel mining industries, did decline by almost one-fifth from 1977 to 1981 while productivity in the nonfarm business sector declined only slightly over this period, significant differences exist among the various U.S. mining industries regarding performance since 1977 (Table 3). Productivity increased approximately 23 percent in coal mining and 38 percent in iron ore mining between 1977 and 1981, a period in which U.S. productivity on the whole was stagnant and overall mining industry productivity declined significantly. Iron ore productivity rose because of the increasing proportion of taconite in the production processes that are far more capital intensive. Taconite production processes accounted for about 80 percent of total usable iron ore output in 1977 and 95 percent in 1981.[7] Similarly, the dramatic rise in coal mining productivity resulted from the increased use since 1977 of capital-intensive surface mining techniques and the trend in recent years to develop larger mines and consolidate operations for greater efficiency.[8] By way of comparison, productivity in copper ore mining and nonmetallic mineral mining since 1977 has tracked with productivity of the overall U.S. economy; however, both of these mining sectors performed better than the economy as a whole in the period from 1969 to 1979 (Table 3).

Thus, since 1977 two important mining industries performed about as well as--and in two cases, significantly better than--the overall economy. All four industries performed far better than the total U.S. mining industry. The most important factor in the drop in total U.S. mining industry productivity from 1977 to 1981 was a decline in oil and gas industry extraction productivity, resulting from a relatively constant oil and gas output (Table 4) and an increase in yearly employment hours in the oil and gas extraction industry of 83.4 percent (Table 5) over the five-year period. The output performance reflected the industry's increasing difficulty in finding giant domestic oil and gas deposits, the decline in productivity in many producing fields, and the increasing development of stripper wells and enhanced recovery techniques. Employment hours thus increased significantly because of expanded exploration and stripper well and secondary recovery activities. It is possible that this productivity decline may be a short-run phenomenon which reflects a major effort of the U.S. oil and gas industry during the 1977-81 period to increase future oil and gas production by expanding exploration activities and developing other techniques, including enhanced recovery. Since the production resulting from such exploration efforts and research take place with lead times ranging up to 15 years, productivity rates could increase in the future.

6/ Page 3 of work cited in footnote 3.
7/ U.S. Bureau of Mines, December 1982. It is important to note that in 1977 a major strike occurred in iron ore mining, leading to lower productivity for that year.
8/ U.S. Department of Energy, Energy Information Administration. 1981 Annual Report to Congress, Vol. II: Energy Statistics. Pages 119, 124-125.

TABLE 4

U.S. Annual Crude Oil and Natural Gas Production

	Crude Oil Production		Natural Gas Production	
	1000's of barrels/day	Quadrillion BTUs	Billions of cu. ft.	Quadrillion BTUs
1977	8,250	17.454	20,025	19.565
1978	8,707	18.434	19,974	19.485
1979	8,552	18.104	20,471	20.076
1980	8,597	18.249	20,379	20.112
1981	8,572	18.146	20,178	19.887
1982	8,670 (October estimate)			

Source: U.S. Department of Energy. December 1982.

TABLE 5

Annual Employment Hours[1/]
(Billions of Hours)

	1977	1978	1979	1980	1981
Metal Mining	0.192	0.201	0.216	0.207	0.219
Coal Mining	0.489	0.443	0.552	0.519	0.468
Oil and Gas Extraction	0.887	1.005	1.095	1.321	1.627
Nonmetallic Mining	0.269	0.276	0.290	0.278	0.266

1/ Based on two-digit SIC industry classification and establishment data. Annual employment hours = number of employees x average weekly hours x 52.

Source: U.S. Department of Labor, Bureau of Labor Statistics, 1982. (Unpublished employment data.)

In sum, the U.S. nonfuel mining industry's productivity performance compares favorably with that of the economy since 1977. The decline in overall mining productivity reflects the short-run efforts of the oil and gas industry to expand exploration efforts, as well as the difficulty in finding giant oil and gas fields. Therefore, the problems of the U.S. nonfuel mining industry are not primarily a function of poor productivity performance, but rather of other factors including weak demand for the product and high real interest costs.

INTERNATIONAL ISSUES AND ACTIONS

EUROPEAN ECONOMIC COMMUNITY ACTIONS

Steel Export Agreement Reached with United States: In late October agreements were reached between the United States and the European Economic Community (EEC) to limit steel imported to the United States from the EEC through the end of 1985. Under one agreement, imports in 10 major steel product categories will be limited to a fixed share of the U.S. market by a system of EEC export licenses. The market shares range from 2.2 percent for tin plate to 21.85 percent for sheet piling. The collective market share for the 10 categories will be about 5.5 percent. In a second agreement the EEC and the United States agreed to restrict imports of pipe and tube from the EEC if they exceed a market share of 5.9 percent. As a result of the agreements, the U.S. steel industry withdrew the anti-dumping and countervailing duty complaints concerning many of the products covered by the agreements. (See Minerals and Materials, August/September 1982, p. 8.) The steel agreement may reduce steel imports from the EEC over the next year by about 1 million short tons; as a comparison, U.S. production of steel in 1982 is estimated to be 62 million tons. In 1981 U.S. steel imports totaled 19.9 million tons; 6.5 million tons were from the EEC. The agreements with the EEC leave unsettled other steel trade disputes, including charges by the U.S. industry of unfair trade practices by companies in Japan and the specialty steel industry in the EEC.

EEC Panel to Urge Further Steel Plant Closings: The European Commission reportedly is calling for another massive round of European steel plant closings in an effort to restore the industry to profitability by 1985. Output, prices and imports have been controlled by a group of European steel companies, EUROFER, since 1978; 22 percent of the EEC's steel industry labor force have lost their jobs since that time. Etienne Davignon, industry commissioner of the EEC, was expected to ask industry ministers to agree to cut annual production capacity by between 33 million and 38.5 million metric tons. Such a reduction would mean the closing of up to 20 more plants, with the loss of tens of thousands of jobs. Some diplomats are said to believe that Davignon's closure target is overly ambitious in view of the serious social upheavals further closings would cause. Davignon predicted that the Community's finished steel production capacity would be 165 million tons in 1985 without such cuts. With consumption estimated at only 112 million tons, surplus plant capacity will represent 32 percent of installed capacity, leaving virtually no prospect of the companies' pulling out of their financial troubles. Davignon is also determined to tighten controls on aid to steelmakers. Meanwhile, the Federal Republic of Germany's economic minister, Otto Lambsdorff, announced that the Bonn government would not remain passive if extensive aid by EEC member governments to their steel industries threatened German steel jobs and plants. The Federal Republic of Germany expects the European Commission to insist that European steel companies adhere strictly to the Community's price and output rules. Many European steel firms are either nationalized or benefit from state assistance.

Steel Import Duties: The Executive Commission of the EEC declared that it would impose higher duties on certain steel imports to discourage what it contended were "unfair sales practices" of a number of exporting nations, including Spain, Brazil and some East European countries. The executive commission said in Brussels that it had amended its anti-dumping rules to allow for swifter action and higher levies on

unfairly priced imports. (Dumping occurs when a country sells goods abroad at a lower price than on the home market.) The anti-dumping duty would automatically equal this difference. Previously, the EEC's anti-dumping duties had equaled the difference between exporters' prices on the European market and an annual reference price based on prices in Japan.

Duty Set on U.S. Sodium Carbonate: The EEC's executive commission has imposed a provisional anti-dumping duty of between $20.18 and $22.35 a ton on sodium carbonate imports from the United States, or more than 10 percent of the price of sodium carbonate exports delivered to Western Europe from Wyoming. The duty followed a complaint lodged in May by the European Council of Chemical Manufacturers Federations that some U.S. export prices for sodium carbonate were "unfairly low." The duty does not apply to exports by FMC Corp. (Chicago, Ill.) and Allied Corp. (Morristown, N.J.), since those companies have reportedly pledged to raise their export prices to eliminate the dumping margin, but is applicable to exports by the Texasgulf Chemical of the Societe Nationale Elf Aquitaine of France, Tenneco Minerals Company, Stauffer Chemical Company of Wyoming, and the Kerr McGee Chemical Corporation.

INTERNATIONAL TIN MARKET

International Tin Council: The International Tin Council (ITC) decided to retain the current strict export restrictions on tin-producing countries. Under the program, producers will be allowed to export a total of 23,200 metric tons of tin during the fourth quarter, a 36 percent reduction from estimated exports. This quota is basically the same as in the third quarter. Export controls are one mechanism the ITC uses to help protect its floor prices. An ITC delegation attempted to persuade the U.S. government to suspend its daily General Services Administration (GSA) tin sales program, but failed. However, since the volume of the GSA tin sales has been negligible over the past two months, such sales have not had an effect on world prices.

Association of Tin Producing Countries: According to published reports, the proposed Association of Tin Producing Countries appears to be having difficulties in formulating its platform. Major differences exist between Malaysia on one side and Indonesia and Thailand on the other concerning tin production policies; generally, Malaysia favors a more restrictive production policy than do the other two countries. The objectives of the association are to regulate supplies, support prices, improve tin production technology, and operate a market information exchange. (See Minerals and Materials, June/July 1982, p. 5.)

BOLIVIA/BRAZIL

Gas Pipeline Study Completed: The state-owned oil companies of Bolivia and Brazil announced that the final engineering study on the gas pipeline from Bolivia to Brazil has been completed and accepted by both sides. The plan calls for construction of 570 kilometers of pipeline in Bolivia and 1,370 kilometers in Brazil. In addition, Bolivia will invest $700 million to upgrade its gas production and transportation facilities. The pipeline to Brazil will supply 400 mcf per day of natural gas and will generate as much as $500 million per year in foreign currency for Bolivia. The agreement is of particular importance to the economy of Bolivia because it would

provide a most promising long-term export market for Bolivia's natural gas and possibly a major source of foreign exchange earnings.

BRAZIL

Economic Conditions Forcing Changes in Energy Programs: Due to the recession and the impact of both increased domestic oil production and declining world petroleum prices, Brazil is modifying its national coal development and nuclear energy programs. In the initial plan, Brazil was to build 16 nuclear reactors (under a nuclear energy technology exchange agreement with the Federal Republic of Germany), produce 27 million tons of domestic coal per year (over five times the current 5.2 million tpy level) and construct several new coal-fired thermoelectric plants. According to the revised energy plan, Brazil will increase coal production to only 9.5 million tpy, construct only eight of the previously scheduled nuclear reactors and slow the planned construction of the thermoelectric plants. The United States, a major source of coal for Brazil, supplied 63 percent of the 3.8 million tons of coal imported by Brazil in 1981. Potential Brazilian coal reserves are estimated to be 23 billion tons, 80 percent in Rio Grande do Sul State and the remainder in the States of Santa Catarina (2 billion tons) and Parana (2.6 billion tons).

Effort to Save Vital Alumina Plant: Talks opened between the Brazilian state company, Companhia Vale do Rio Doce (CVRD), and its Japanese partners, the Nippon Amazon Aluminium Company (Nalco), concerning the future of the Alunorte project, an alumina plant with a capacity of 800,000 tpy due to come onstream in 1985. The Japanese are reported to be at the point of pulling out of the Cr$750 million ($315 million) aluminum project, in which they have a 49 percent share, as they believe it is uneconomic. CVRD is said to be preparing two counter-proposals. The latest delay and possible cancellation of the Alunorte project will prejudice plans already being implemented to expand from 3.5 to 8 million tons the annual capacity of the Trombetas bauxite deposits in the middle Amazon (in which Shell is said to have a large interest). The larger Albras-Alunorte project, with planned total investments of over Cr$2.1 billion ($882 million), is central to Brazil's plans to open up the eastern Amazon region through the Grande Carajas mineral development project (see Minerals and Materials, August/September 1982, pp. 8, 9).

CVRD Selected to Develop Carajas Manganese Resources: The Government of Brazil recently selected its state-controlled Companhia Vale do Rio Doce (CVRD) to develop the large manganese resources of the Carajas region, thereby clearing the way for an increase in Brazil's ore production and smelting of manganese. Sizable ferromanganese and hydroelectric facilities in the Carajas are planned. Development of the manganese resources of the Carajas will sustain Brazil's ore production beyond an otherwise projected decline by the 1990's. Brazil, in 1981 the world's third-largest producer of manganese ore after the Soviet Union and South Africa, has been the fourth most important source of manganese ore and a modest but increasingly significant supplier of manganese ferroalloys to the United States in recent years. In 1981 Brazil supplied 69,775 tons of ore or 12 percent of total U.S. imports of manganese ore, and 46,850 tons of manganese ferroalloys (ferromanganese and ferrosilicomanganese) or 6.4 percent of total U.S. imports. Its manganese ore production has been about one-third that of South Africa. The net effect of developments in the Carajas on world manganese markets will probably be to increase Brazil's exports of manganese ferroalloys, but ore exports from the Carajas will be limited to 25 percent of total production.

CHILE

International Bidding Opened on Andacollo Copper Deposit: ENAMI, the Chilean national agency for small- and medium-scale mining enterprises, has opened the Andacollo copper deposit to international bidding. The project had been shelved since the collapse of a joint venture between Noranda Mines Ltd. and ENAMI because of differences over financing. The Andacollo copper deposit, located near Coquimbo, contains estimated reserves of 300 million tons of ore containing 0.69 percent copper (2 percent of Chilean copper reserves) together with gold and silver. Bids will be accepted until January 12, 1983.

CHINA

Beryllium Products Offered for Sale: Because China is currently offering for sale a fairly complete line of beryllium materials, ranging from beads, alloys, metals and oxides to beryllium chemicals, some experts believe that a processing facility for beryl has been developed in China. If indeed this plant exists, it would be the only beryllium processing plant outside the United States and the Soviet Union. The major uses of beryllium are in nuclear reactors, the aerospace industry, electrical equipment and electronic components.

COLOMBIA

Nullification of Coal Contracts Sought: Two separate suits presented to Colombia's Council of States, the nation's highest judicial body, seek to nullify contracts granting coal concessions to Marathon Mining Corp. (U.S.). Marathon holds 30-year rights to the Juqua fields in the Chiriquana area in the northeastern Department of Cesar. The 12,500-acre concession contains an estimated 200 million tons of coal reserves. The nullification suits were prompted by recent reports concerning the circumstances under which contracts were granted to Marathon in December 1981. Under 1979 legislation nationalizing Colombian coal deposits, new contracts can be granted only to companies that have been mining continuously from 1973 through 1980, and mining activities must be verified by on-site government inspection.

JAMAICA

Additional Bauxite Production Cutbacks Announced: In response to depressed world aluminum market conditions, Jamaica's two major bauxite producers--subsidiaries of Reynolds Metals Co. and Kaiser Aluminum and Chemical Co.--announced additional production cutbacks starting in October 1982. These actions would reduce total bauxite available for future export by Jamaica by about 1.5 million tpy. A total bauxite production level below 8 million tons is now estimated for 1982. In 1981, Jamaica exported approximately 5.8 million tons of bauxite, all to the United States, and these imports accounted for 44 percent of total U.S. bauxite imports. Earlier in 1982, the U.S. purchase of 1.6 million tons of Jamaican bauxite for the strategic stockpile permitted the two Jamaican bauxite companies to operate without severely curtailing output. Jamaica's Prime Minister Edward Seaga has stated that he expects the United States to buy an additional 1 million long dry tons of bauxite for the stockpile.

JAPAN

Steelmakers Hurt by World Recession: Japan's steel companies, which are among the most efficient steel producers in the world, have also been hurt by the world recession. Japanese steel production is at its lowest level in decades, with output in 1982 likely to fall below 100 million metric tons for the first time in 10 years and with profitability likely to experience serious declines. In 1981 Japan's steel production was only about 64 percent of capacity. The condition of the Japanese industry is exemplified by the performance of Nippon Kokan Co. (NKK), the nation's second-largest steelmaker (after the Nippon Steel Corporation), which experienced a 30 percent decline in earnings for the fiscal year ending March 31, 1982. Although NKK can produce 22 million tons of high-quality steel, it can only sell about 12 million tons this year. NKK's Keihin works, one of the world's most modern plants, is producing at about 80 percent of capacity, while NKK's other steel plant, the world's largest steelmaking operation, is running at about 50 percent of capacity. Despite a near-term outlook for limited demand, the Japanese industry is continuing to make major capital investments and to introduce new techiques. Japanese steelmakers have invested nearly $3.5 billion during 1982, as compared to $3 billion in 1981. The capital investment plan of NKK included spending 10 years and $4 billion to create an artificial island on which to build its Keihin steel works. The plan for this plant included a reduction in the work force and computerizing the steelmaking. The old plant employed 18,000; the new plant will employ just 8,000. (See related story in this issue under "U.S. Mineral Industry Highlights: Iron Ore and Steel.")

SOVIET UNION

Soviet Nickel and World Prices: Soviet nickel, reportedly entering the United States without payment of the required duty, has been blamed in part for depressed nickel prices over the past two years. Additionally, traders are reported to have purchased Soviet nickel plating material in Europe, where it is processed, and brought it into the United States at low prices. Some sellers appear to have escaped the duty since their nickel plating material would not necessarily be identified as Soviet in origin. Western dependence on Soviet nickel exports is increasing. At present France and the Federal Republic of Germany are importing sizable quantities of Soviet nickel. The Soviet Union is continuing to expand its nickel production at Norilsk and in Cuba and should continue to play a major role as a nickel exporter. Soviet nickel sales totaled an estimated 100 million pounds in Western Europe for 1982, 20 million more than in 1981 and 28 percent of the Western European market. The largest suppliers of nickel to Western Europe are Canada and New Caledonia.

SPAIN

Aluminum Industry Cash Crisis: The aluminum industry of Spain, like that of other countries, has excess capacity, high operating costs and a heavy debt burden. The combination of these problems, coupled with sharp disagreement among major shareholders over the remedies, led Spain's largest aluminum producer, Aluminio Espanol, and its alumina subsidiary, Alumina Espanola, to apply for temporary receivership. The majority shareholder, INI (the state holding company), is involved in talks with the two companies' creditors. Aluminio Espanol and Alumina Espanola have a debt/asset ratio of 64 percent, with outstanding debts of $900 million against assets of $1.4 billion. The government had decided in 1978 to proceed with an

ambitious project at San Ciprian, in Galicia, to double Spain's production of both alumina and aluminum; no sooner was this project underway, however, than energy costs soared and international markets began to soften. Since the project's conception, aluminum prices have fallen by 60 percent. All these factors in turn affected the financing of the project, which was based on heavy borrowing to be repaid out of the cash flow derived from sales of aluminum, and led to the application for receivership.

UNITED KINGDOM

Steel Trade Unions Urging Actions Against Imports: The British steel trade unions have urged Industry Minister P. Jenkins to take action against steel imports from the Republic of Korea, South Africa and Eastern European countries on the grounds that these nations are subsidizing their industries, resulting in lower product prices. They also planned to picket the landing of a cargo of U.S. plate wirerod. The unions allege that the "cheap" steel has damaged the market share of British Steel Corporation (BSC) in the face of diminished demand; some 12,000 workers at BSC might lose their jobs, with an anticipated reduction in capacity from 14.4 million to 8 million tons per year. The steel unions have prepared a four-point plan to resist the cutbacks they fear will be announced shortly when BSC completes its new corporate plan.

Alcan Offers $29 Million for British Aluminium: The United Kingdom's two leading aluminum manufacturers, Alcan Aluminium (U.K.) and British Aluminium (BACO), announced terms of a merger that they believe "offers the best chance of creating a UK aluminium company which is competitive in the long run." The companies declared that they would rationalize their activities, and that this would "inevitably result in a loss of jobs and the changing of others." The two aluminum companies lost an aggregate 50 million pounds sterling in 1981 and each is experiencing serious losses this year. In the first half of 1982, aluminum imports in the United Kingdom rose to 50 percent of domestic sales in rolled products, 39 percent in foil and 16 percent in extrusions. The Amalgamated Union of Engineering Workers pledged support to its members if the merger threatened cuts and plant closures, but the boards of both companies stated "levels of employment will be higher than if the two groups were to remain separate." Both companies now employ some 7,000 workers in the United Kingdom.

Titanium Granule Plant to Open in Wales: The world's newest titanium plant opened on November 26 at Deeside, in depressed North Wales, and it will be Western Europe's only titanium-granule producer. The other producers are the Soviet Union (producing as much titanium granules as the rest of the world put together), the United States (where earlier this year International Titanium opened a new 5,000 ton factory) and Japan (where Showa Denko plans to expand its Toyama plant by 3,000 tons in 1983). Deeside Titanium has been built largely to rescue the nationalized aero-engine maker, Rolls-Royce, which relies on titanium granules.

FEDERAL, STATE AND LOCAL ACTIONS

UNITED STATES TO PROBE AID TO STEELMAKERS IN SIX COUNTRIES

In November President Reagan ordered an emergency investigation of subsidies to specialty steel producers by six European governments and promised to restrict imports of these products if the aid is shown to be injurious to the U.S. steel industry. The probe, in response to complaints by U.S. specialty steel producers, will cover imports of alloy tool steel and stainless bar, rod, plate, sheet and strip steel from France and one or more of these products from Australia, Belgium, Italy, Sweden and the United Kingdom. Mr. Reagan termed the U.S. industry's complaints against the European subsidies "well founded" and said that if necessary he will invoke the 1974 Trade Act, which provides the President with sweeping powers to restrict imports through quotas and other policy actions. The President also asked U.S. Trade Representative William Brock to seek talks between the United States and the Europeans aimed at eliminating subsidies on specialty steel. The subsidies the U.S. industry has complained about include preferential loans, government guarantees and grants, and interest rebate programs. The Reagan administration had also hoped to include limits on specialty steel imports in a broader export-restraint agreement that the United States negotiated with the EEC last month, but the U.S. producers rejected the proposed agreements as inadequate.

The President's order marks the first time that the United States has initiated such an emergency investigation on its own. Trade officials estimated that the inquiry would be completed within a few weeks, rather than the six-month period usually required. It is clear from the President's statement that the administration would prefer to resolve any complaints through negotiations, rather than by imposing import restrictions.

STRATEGIC STOCKPILE ACTIONS

Iridium: In September, the General Services Administration (GSA) purchased 600 troy ounces of grade B (99.8 percent) iridium from Johnson Matthey Inc., reportedly at $320 per ounce; on October 21, GSA purchased an additional 600 ounces of grade B iridium from Amax Inc. at $300 per ounce. Beginning in December 1981 and continuing throughout 1982, GSA has purchased 6,600 ounces of iridium at an average price of $370 per ounce. The National Stockpile inventory now contains 24,000 ounces.

Mercuric Oxide: In August, GSA sold 1,000 pounds of surplus mercuric oxide at its first of a series of monthly auctions. GSA planned to offer a maximum of 35,000 pounds of mercuric oxide on the first Wednesday of each month with a minimum acceptable bid of 1,000 pounds. GSA rejected bids received in September and October and announced that auctions were withdrawn for November and December because the containers holding the mercuric oxide do not meet U.S. Department of Transportation regulations.

Tin: From July 1 through September 30, 1982, total GSA tin sales from the strategic stockpile reached 10,000 metric tons. GSA was authorized to sell up to 30,000 tons over a three-year period.

Tungsten: On October 1, GSA reduced its monthly excess tungsten concentrate stockpile offerings from 1 million to 500,000 pounds. The maximum that can be sold annually was reduced from 9 to 6 million pounds. This action resulted from intense lobbying by U.S. tungsten producers for a major reduction or complete cessation of tungsten sales during the current recession.

INTERNATIONAL TRADE COMMISSION

A preliminary determination in early November by the International Trade Commission (ITC) seems to indicate that the California-Nevada cement industry is threatened by Japanese and Australian cement imports sold at less than "fair value." Nine cement companies and 13 cement plants operate in the California-Nevada region. Pending a determination by the Department of Commerce on the alleged "dumping" of these imports, the ITC will proceed with its investigation and to make a final determination within 120 days. The investigation was initiated after Kaiser Cement Corp. filed a petition with the ITC and the Department of Commerce on September 23 requesting anti-dumping duties on Japanese and Australian cement imports. These imports, accounting for a negligible share of the California-Nevada market in 1979, have grown steadily to 130,000 tons in the first half of 1982, more than 4 percent of the region's total consumption. According to Kaiser, average capacity utilization for all U.S. cement producers in the region fell from 84 percent in 1979 to 67 percent in 1981. Kaiser was joined in its petition by other cement companies, by the Cement, Lime, Gypsum and Allied Workers' Union, and by the Stone, Glass, and Clay coordinating committee of the AFL-CIO.

ENVIRONMENTAL PROTECTION AGENCY

New Lead Standards for Gasoline: On October 29, the Environmental Protection Agency (EPA) announced new regulations, effective November 1, regarding lead in gasoline. An absolute limit of 1.10 grams of lead per gallon was set, with no exemption for imports. This standard is much stricter than the one that had been proposed in August. Additionally, the small-refiner exemption will be eliminated after July 1, 1983. As compared to the previous standard, the 1.10 gram/gallon limit could decrease lead emissions by 115 billion grams (34 percent) over the next eight years, according to EPA. The four major U.S. tetraethyl lead producers have said that they expect the new standard to have little impact on their overall business operations, but some small gasoline refineries were expected to close.

No Change in Air Pollution Standards for Primary Lead Facilities: Because of moderate projected growth in primary lead smelting, and the likelihood that no new primary facilities will be constructed or existing facilities expanded, EPA has decided against raising air pollution control standards for lead producers, at least for the next four years. Additionally, the agency believes that the net benefits resulting from recent improvements in air pollution control technology are too marginal to warrant their imposition at this time.

New Toxic Metal Wastes Standards May Affect Battery Manufacturers: The battery manufacturing industry may be affected by proposed new EPA regulations under the Clean Water Act dealing with process wastes containing cadmium, lead, magnesium and zinc. In a survey of the industry, the EPA found that 70 of 250 plants have already achieved zero discharge of the waste materials in question. The proposed

new regulations call for the use of end-process technology to reduce toxic metal wastes by 87 percent. It is estimated that the new regulations will cost the manufacturers an additional $27.8 million in capital investment and $7 million in annual operating expenditures.

BONNEVILLE POWER ADMINISTRATION

Appeal on "First Rights" Decision Denied: The U.S. Ninth Court of Appeals in San Francisco rejected an appeal by the aluminum companies of the April decision of the courts declaring existing power contracts invalid. The court decision affirmed that the power contracts had erroneously granted the aluminum industry first rights to "non-firm" power. By law, only public utilities of the Bonneville Power Adminstration (BPA) can be granted "preferred status." The aluminum industry indicated that it will appeal the decision to the Supreme Court.

BPA Eases Rate Hike Impact: BPA has developed a three-step plan to minimize the impact of the new power rate structure on the Pacific Northwest aluminum industry. (See Minerals and Materials, August/September 1982, p. 12.) First, to ease cash flow problems BPA will adjust the power bills monthly to reflect actual costs rather than high estimates. Second, BPA has retained an independent accounting firm to review actual costs of power exchanged by private utilities participating in BPA's residential rate relief program to ensure that the aluminum companies pay only those costs specified by law. Third, BPA has agreed to develop a more stable and predictable rate-making process. The Federal Energy Regulatory Commission (FERC) rejected the request of the Pacific Northwest aluminum industry that interim approval of BPA's power rate increase to 25.9 mills per kilowatt hour be limited to November 30 and that the rate review process be expedited. According to FERC, there will be a 30-day period for public comment related to a final review in the near future. A timetable for the review is not yet available.

ARKANSAS' ALUMINUM INDUSTRY HURT BY POWER CUT: Beginning in 1984, the Southwestern Power Administration (SPA), a Federal regional power agency, will reduce Arkansas' share of SPA-generated power from 28 to 11 percent. This reduction will directly affect U.S. aluminum production by ending the supply of relatively inexpensive hydroelectric power to the Reynolds Metals Co.'s smelters at Malvern and Arkadelphia. Approximately 15 percent of the power supplied by SPA to the smelters is low-cost hydropower, with the remaining percentage generated by coal and nuclear facilities. Reynolds is currently supplied with hydroelectric power at 0.6¢ per kilowatt hour, while other industrial customers pay 1.75¢ per kilowatt hour. Reynolds has indicated that the increased power costs resulting from the SPA decision may have a serious impact on its operations. The company already has laid off more than 1,500 workers in Arkansas.

THE FEDERAL MINING LAW OF 1872 VS. STATE AND LOCAL AUTHORITY: The Colorado Supreme Court ruled that the Federal Mining Law of 1872 preempts mining regulation by State and local governments and that counties do not have authority to deny mining on Federal land. In *Brubaker, Mitchell, and Valco Inc. vs. El Paso County Commissioners*, the Colorado Supreme Court curtailed the power of State and county governments to regulate mining on Federal lands, while permitting State and local governments to impose "reasonable conditions." Further litigation will determine

how stringent the conditions imposed by the State or county may be. This ruling is expected to have widespread application, particularly in the siting of sand and gravel operations and stone quarries where county authorities have often restricted mining company activities.

AGGREGATE MATERIALS PRODUCTION IN MINNESOTA TO BE TAXED: The Minnesota legislature enacted a tax, effective January 1983, on natural aggregate material produced in the State. The aggregate material, including sand, gravel and crushed stone, but excluding dimension stone, is subject to a tax of 10¢ per cubic yard or 7¢ per ton of material removed. County boards in the aggregate-producing areas are responsible for administering the law and will receive the tax proceeds which will be distributed as follows: 60 percent to the county road and bridge fund; 30 percent to towns and cities as determined by the county board; and 10 percent to a special reserve fund for reclamation of abandoned pits located on public or tax-forfeited lands.

SOUTH DAKOTA PROPOSAL TO TAX SEVERED MINERAL RIGHTS: A new tax proposal drafted and approved by South Dakota's Interim Taxation Committee would tax mineral interests separately from the land above them. Under the proposal, owners would have to pay an annual $4 tax on each severed mineral right recorded beginning in July 1985. If the tax on each mineral right were not paid, counties could sell the severed mineral rights at a public auction. Exemptions would be made for severed mineral interests owned by the Federal and State governments and Indian tribes.

ALUMINUM

Revere Files for Reorganization: On October 27, Revere Copper and Brass, Inc., filed for reorganization under Chapter 11 of the Federal Bankruptcy Code. This action was a result of continuing projected losses from the company's primary aluminum operations, and less significant losses from its aluminum rolling mill operations. Revere's profitable copper and brass fabricating plants, in which Asarco owns a 34 percent share, will continue operation. Revere's primary aluminum capacity constitutes 4 percent of the domestic total.

New York Requiring Deposit on Beverage Containers: New York State has joined other states in requiring a mandatory deposit on beverage containers. Beer and soft drink cans represent the largest single market for aluminum in the United States and provide an important end use for tinplate. On a unit basis, New York's beer and soft drink container sales account for about 7 percent of total U.S. consumption. One industry authority predicted that can shipments in New York would drop sharply in the first few months after the ordinance, and then perhaps rise over a two-year period as consumers become familiar with the deposit system.

COBALT

Industry Overview: The U.S. spot price for cobalt has fallen below $6.00 per pound for the first time since 1978. The price range in early October was $5.75 to $6.00 per pound, approximately one-half the 1981 price. Although Zaire, the world's largest cobalt producer, is selling its cobalt at low prices, since February 1982 it has maintained its official producer price for cobalt at $12.50 per pound. This situation adversely affects companies who are contractually obligated to buy cobalt concentrate at a price pegged to the producer price, but must sell refined cobalt on the spot market.

Slopes Beneath Pacific May Contain Cobalt Deposits: The U.S. Geological Survey (USGS) announced that reconnaissance studies of submarine slopes in the north-central Pacific Ocean indicate that the slopes may contain significant quantities of cobalt-rich deposits. USGS Director Dallas Peck stated that "good indirect evidence suggests that similar cobalt-rich crustal deposits may be available at relatively shallow depths in waters close to the Hawaiian Islands, the Trust Territory of the Pacific Islands, and other U.S. Pacific territories and possessions."

COPPER

Industry Overview: The domestic copper mining industry is currently operating at about 67 percent of capacity, as compared to 55 percent in September. Domestic production for 1982 is estimated at 1.1 million metric tons, a 25 percent decrease from 1981. Fourteen of the top 25 mines are closed, and some of the others have curtailed production. Six of the 15 primary domestic copper smelters are closed, and production has declined at most of the others. Nine of the 12 refineries are operating at reduced levels. At the end of October, employment in the domestic copper

industry, including refining, had declined to a level of 16,000, as compared to 42,000 at the beginning of the year. Demand for copper remains low and is not expected to improve until the housing and automotive industries begin to show major improvement.

Cities Service Considering Merger with Occidental: Stockholders of the Cities Service Corp. are scheduled to vote on a merger with Occidental Petroleum Corp. in early December. In anticipation of the merger, Occidental announced that it would sell Cities Service's Pinto Valley operation near Miami, Arizona because of the unsettled conditions in Arizona's copper industry. The Pinto Valley installation had been offered for sale a year earlier by Cities Service. In April 1982, however, Cities Service announced that no suitable offer was received and withdrew the property from the market. Concurrently, Occidental is dismantling its own metal subsidiary, Occidental Minerals Co.

Anamax Up for Sale: In early November AMAX Inc. and Anaconda Minerals Co. (a subsidiary of Atlantic Richfield Co.) announced an agreement to sell the Anamax Mining Co. Each company holds a 50 percent equity interest. An investment source spokesman estimated the asking price for the Anamax Mining Co. at about $200 million. The principal Anamax properties are the Twin Buttes operation south of Tucson and the Helvetia copper deposit southeast of Tucson. Anaconda has been trying to sell its share in Anamax since a 1979 decision of the Federal Trade Commission required Anaconda to divest itself of most of its interest in Anamax by October 1984. Amax reported a loss of $97.1 million for the third quarter of 1982 and a $145 million loss for the first nine months of 1982 and therefore is seeking to reduce further losses.

CRUSHED STONE

Proposed User Fee May Assist Industry: The Administration, at the suggestion of the Secretary of Transportation, is considering a user fee on gasoline of up to 5¢ per gallon to be targeted specifically at the rehabilitation and construction of transportation infrastructure, including the highway system. This measure should assist the depressed crushed stone industry, which depends on the transportation infrastructure for 70 percent of its sales. At present, the crushed stone industry is producing at about 79 percent of its peak output for 1979.

FERROALLOYS

Industry Overview: Domestic production of bulk ferroalloys containing chromium, manganese and silicon continued to decline during September and October and is currently estimated to be at 20 percent of capacity. Employment for the U.S. ferroalloy industry is presently estimated at 2,700, a 65 percent decline since 1981. Producers have cited a number of factors responsible for the decline, including weak markets, low-priced imports, high operating costs, and excessive consumer inventories. The Elkem Metals Co. is the only current U.S. producer of standard-grade ferromanganese: Autlan Manganese Corp. halted production of manganese ferroalloys at its Mobile, Alabama plant several months ago.

Trade relief for the domestic high-carbon ferrochromium industry currently consists of an extra duty of 4¢ per pound of contained chromium on high-carbon ferro-

chromium imported at a value of less than 38¢ per pound of contained chromium. Following the November 15 expiration of the Federal government's trigger-price program for high-carbon ferrochrome, the price range for imported 50-55 percent charge chrome--the major grade used in steelmaking--promptly declined from 45-47¢ to 38-42¢ per pound of contained chromium. This decline placed a further burden on the already financially troubled domestic high-carbon ferrochromium industry. Macalloy Inc., operating under Chapter 11 of the Federal Bankruptcy Act since earlier this year and at present the only U.S. firm producing 50-55 percent charge chrome, will be especially hard hit by this price decline. On the other hand, the decline in prices would be expected to assist the depressed domestic stainless steel industry, which opposes the duty on imported high-carbon ferrochromium.

GOLD

Strike Settled at Homestake Mine: A four-month strike at the Homestake gold mine at Lead, South Dakota ended in late September as union miners voted to accept a new 44-month contract that gives miners raises of 6, 7 and 8 percent for the next three years along with improved fringe benefits. The strike, the second and longest in the mine's 106-year history, caused an economic pinch in the northern Black Hills, where Homestake has a monthly payroll of $3 million. The State of South Dakota lost about $2 million in severance tax revenues during the strike. (See Minerals and Materials, June/July 1982, p. 9.)

IRON ORE and STEEL

U.S. Steel Reorganizes: The United States Steel Corp. of Pittsburgh has announced the formation of a new Mon Valley Works to include the Homestead, Edgar Thomson, National, Duquesne and Clairton facilities in the Pittsburgh area along the Monongahela River. The Irvin plant merged into the Gary (Indiana) Works several months ago and is not included in this grouping. The Mon Valley Works currently employs about 7,400 workers.

National Steel May Sell Plant to Employees: National Steel Co., the fourth largest U.S. steel company, has initiated negotiations with representatives of 10,000 employees at its Weirton, West Virginia plant, which recently reported a $94 million net loss for the third quarter, concerning employee purchase of the huge steel mill. Weirton's annual sales, expected to reach $1.3 billion this year, would make it about the eighth largest U.S. steelmaker. If successful, the negotiations could lead to the creation of the largest employee-owned company in the United States among the 300 largest U.S. industrial companies. Weirton steel workers and management have been discussing ways to rescue the plant since last March, when National Steel first announced its intention to sell the plant. Given the depressed state of the steel industry, it is assumed that the plant will sell for considerably less than its $322 million book value. A major obstacle to the purchase would also be an estimated $100 million unfunded pension liability.

McLouth Workers Approve Pact, Clear Way for Sale to Tang: After several months of negotiations Tang Industries, Inc. has signed an agreement to purchase the bankrupt McLouth Steel Corp. in Trenton, Michigan. A spokesperson for McLouth's secured creditors stated that no major problems were anticipated. Unionized workers approved a concessionary contract that cleared the way for the purchase. Tang is

expected to maintain production at current levels. McLouth is the 11th-largest domestic steel company.

Steel Mill Sale Faces Delay: Nippon Kokan Co. (NKK), the second-largest Japanese steelmaker, has been negotiating to buy Ford Motor Co.'s Rouge Steel Co. subsidiary near Detroit. Recent reports indicate that disagreements over the purchase price and the union contract may delay any decision on the sale until the end of 1982. NKK has been considering purchase of the Rouge operation since last August and indicated previously that a decision would be made by the end of October. (See Minerals and Materials, June/July 1982, p. 9.)

United Steelworkers of America Reject Concessions: Leaders of the United Steelworkers of America (USW) locals have rejected a new labor agreement, negotiated with eight major steel companies, that would have significantly reduced labor costs for U.S. steel companies facing strong foreign competition and weak demand. This was the second unsuccessful effort by the companies and USW leaders to agree on cost-saving concessions which would be acceptable to the union's members. Agreements negotiated by the eight-company industry bargaining committee would have served as models for many of the remaining steel companies. For the first time since 1971, there is the threat of a nationwide steel strike next year if an agreement cannot be reached by August 1. Strikes were forbidden in 1977 and 1980 by the Experimental Negotiating Agreement (ENA) that guaranteed workers a pay increase of at least 3 percent and cost-of-living increases in return for a promise not to strike. The ENA has been allowed to lapse.

Workers at CF&I Steel Corp. Agree to Wage Reduction: CF&I Steel Corp., of Pueblo, Colorado, reported a $12 million loss for the third quarter of 1982. Sales were down 19 percent in the first quarter and 50 percent in the second quarter. As a result, the company has reduced its labor force from about 6,000 to 3,500 and shut down four blast furnaces during the past year. To ease the company's losses and save their jobs, members of three USW locals at CF&I voted on October 10 to accept a reduction of about $5 per hour in wages and benefits until October 1, 1983. The company will share with the workers 40 percent of any operating profit exceeding 10 percent of the shareholder equity of $217 million. Last year the CF&I plant provided more than 10 percent of all jobs and 30 percent of all payrolls in Pueblo County, Colorado. The company recently filed suit against Mitsui & Co. for allegedly dumping steel products that compete with CF&I's product line. (See Minerals and Materials, August/September 1982, p. 12.)

LEAD

Taracorp Files for Reorganization: On October 1, Taracorp, Inc., the nation's fifth-largest secondary lead producer, filed for reorganization under Chapter 11 of the Federal Bankruptcy Code. Taracorp operates three smelters with 60,000 metric tons of total capacity in Atlanta, Georgia and McCook and Granite City, Illinois. A fourth smelter in St. Louis Park, Minnesota was closed in March of 1981. Production at the Taracorp smelters in 1981 was approximately 5 percent of the total U.S. lead recovered from scrap at secondary plants.

Exxon Minerals Interested in Missouri Lead-Zinc Facilities: Exxon Minerals Co., a division of the Exxon Corp., was reported to be considering the purchase of AMAX Inc.'s 50 percent share of the Buick lead-zinc mine and lead smelter. The other 50

percent equity is controlled by the Homestake Mining Co., of San Francisco. The Buick operation is the largest producer of lead concentrates and the fifth-largest producer of zinc concentrates in the United States.

Bunker Hill Lead/Zinc/Silver Complex Sold: A group of private investors announced the purchase of the Idaho holdings of the Bunker Hill Co. from Gulf Resources & Chemical Corp., effective November 1. Prior to its announced closure in August 1981, the Bunker Hill mining and smelting complex employed more than 2,000 people, some 72 percent of all primary employment in the Coeur d'Alene mining district, and produced approximately 15 to 20 percent of U.S. primary lead and zinc metal. The operation was also a major silver producer. The new owners plan to continue plant maintenance until metal prices stabilize.

MAGNESIUM

Demand for Magnesium Granules and Powder Increases: Despite the current overall decline in magnesium metal consumption, demand has begun to increase for magnesium granules and powder for the preparation of low-sulfur steels. Significantly increased demand for magnesium metal could occur if the steel industry uses magnesium to desulfurize steel outside of the furnace in the ladle or torpedo car, rather than another method within the furnace.

SODA ASH

Industry Overview: Soda ash, produced from natural deposits in Wyoming and California and by the Solvay process in New York, is used principally for the manufacture of glass, chemicals, soaps and detergents. Wyoming producers in June began lowering the price of natural soda ash by increments of $2 per ton from its previously steady level of $92 per ton. At present, the f.o.b. price of synthetic soda ash is 57 percent higher than that of Wyoming soda ash ($132 and $84 per ton for synthetic and Wyoming natural soda ash, respectively). The last remaining domestic synthetic soda ash plant, owned by the Allied Corp. and located in Syracuse, New York, is struggling to compete with Wyoming and California producers of natural soda ash. The Syracuse plant may also be affected by Allied's decision to reduce its market share in the chemicals sector after its merger with Bendix Corp. If the Syracuse plant shuts down, over 700,000 tons of annual nameplate capacity, representing 6 percent of domestic industry nameplate capacity, would be lost.

ZINC

Surplus Production Predicted: The International Lead and Zinc Study Group (ILZSG) at its annual meeting in October forecast increased zinc mine production in 1982 and 1983. The increased output was expected to ease the tight concentrate supply positions that had developed in both years, but the surplus may be moderated through production adjustments that reflect the changes in the world economy.

SELECTED NEW CONTRACTS, INVESTMENTS, EXPANSIONS AND EXPLORATION ACTIVITIES, UNITED STATES

OCTOBER - NOVEMBER 1982*

Commodity/Company	Operation and/or Location	Action or Event	Notes
ALUMINUM			
Howmet Aluminum Corp.	Hawesville, KY	Announced plans to begin commercial production of continuous cast "hard" alloyed sheet products next summer at its rolling mill using a new technology; Jumbo 3C caster will be assembled by April 1983.	Caster and technology were developed by Societe de Conditionnement en Aluminum (SCAL) of France; one advantage of the process is that it functions with a number of feedstock materials including ingot, molten metal, mill scrap and processed can scrap.
BERYLLIUM			
Brush Wellman, Inc.	Elmore, OH	Announced $13 million expansion and modernization of beryllium-copper wire tube and rod plant to begin in early 1983 and to be completed by 1985.	Plant designed to meet future requirements for beryllium-copper products in oil and gas drilling and exploration activities and in load bearing applications such as aircraft bushings and bearings.
BROMINE			
Dow Chemical Co.	Magnolia, AR	Resumed construction of 120 million pound per year calcium bromide solution plant.	Construction, begun in 1979, was halted as demand by the oil and gas industry for calcium bromide solution slackened; according to a Dow spokesman the market is improving.
COLUMBIUM			
NRC Inc.	Newton, MA	Announced plans to initiate production of columbium mill products in 1983; installation of an electron beam furnace and a rolling mill has been completed.	The facilities will allow NRC, currently a major domestic tantalum metal producer, to compete with the major domestic columbium processing and producing companies.
COPPER			
ASARCO Inc.	Hayden Smelter, AZ	Began $132 million modernization program Nov. 1 to include installation of a flash furnace.	One of two reverberatory furnaces was shut down; 51 of the 456 employees will be idled for one year; smelter will operate at 65% capacity until new unit is operational.
Chino Mines Co.	Santa Rita and Chino Mines, NM	Recalled 105 miners to strip overburden.	
	Hurley, NM	Planned $100 million modernization of smelter which will provide about 500 construction jobs.	Includes expansion of capacity from 300,000 stpy to 500,000 stpy and conversion to flash smelting.
Duval Corp. (subsidiary of Pennzoil Co.)	Sierrita Mine, AZ	Began installation of a $14 million prototype portable crusher.	
Magma Copper Co.	San Manuel Mine, near Tucson, AZ	Recalled 60 of the 980 laid off employees for development work to keep production at 20% of normal.	Company notes that the recalls were not attributable to any improvement in the economic position of the copper industry.

*Data presented in this table are based on information as of November 30, 1982.

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Commodity/Company	Operation and/or Location	Action or Event	Notes
(COPPER)			
Phelps Dodge Corp.	Metcalf Mine / Morenci, AZ	Reopened Oct. 5.	Had been closed since Jan. 1981.
	Morenci Mine / Morenci, AZ	Reopened Oct. 19.	Had been closed since Apr. 17, 1982.
GOLD			
Homestake Mining Company	Lead, SD	Four-month strike terminated September 26 following approval of new 44-month labor contract; returned to full production near end of October.	Company was the leading domestic producer of gold in 1981.
Silverado Mines Ltd.	Grant Mine, west of Fairbanks, AK Ester Dome Project	Plans to continue surface and underground exploration and development through May 1983; construction of mill with capacity of 100 to 500 tons per day planned for 4-month summer season in 1983.	Company announced measured reserves of 56,000 tons averaging 0.7 oz. gold per ton at the Grant Mine; company's economic studies indicate this mine would be profitable at a production level of 100 tons per day and gold at $300 or more per ounce. Exploration drilling and trenching on other claims on the Ester Dome Project has been promising; company hopes to block out about 1.3 million tons averaging 0.3 oz. gold per ton.
Placer Amex, Inc.	Golden Sunlight Mine, east of Whitehall, MT	Moved startup date forward to February 1983; work underway on a 5,000 ton per day ore crusher and related mine buildings.	Thirteen-year open pit operation planned; ore reserve estimated at 26 million tons.
IODINE			
North American Brine Resources (NABR)	Dover, OK	Announced plans to become the third U.S. company to produce iodine by year's end; plans to increase domestic production an additional 5 percent in 1983 and 10 percent in 1984.	Iodine is imported primarily from Japan and Chile. The U.S. has the capacity to produce about one quarter of domestic needs.
IRON ORE and STEEL			
Cleveland-Cliffs Iron Co.	Tilden and Empire Mines near Ishpeming, MI	Reopened 4 of 6 pelletizing lines; recalled about 1,350 employees Nov. 22.	1,450 employees still laid off.
Pea Ridge Iron Ore Co.	Near Sullivan, MO	Resumed limited production of iron ore at underground mine Nov. 1; 100 employees recalled.	Production could be suspended by the end of the year if no further orders for pellets are received; pelletizing plant has a capacity of 1.65 million tpy.
U.S. Steel Corp.	Atlantic City, WY	Reopened iron ore mine Oct. 26 after a 5-week shutdown; about 450 employees recalled.	Produces pelletized ore from taconite for U.S. Steel's Geneva Works at Provo, UT.
POTASH			
International Minerals and Chemical Corp.	Carlsbad, NM	Planned $1 million expansion of compaction plant operations to produce a more granular potash product; preparing for construction of a $10 million access shaft, the fifth entry-way into its mine.	

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Commodity/Company	Operation and/or Location	Action or Event	Notes
SILVER			
Gila Mines Corp.	Gila Canyon Mine, east of Tonopah, NV	Planned full-scale production by next spring.	A 3-phase drilling program initiated in November 1981 has established proven, possible and probable reserves of nearly 370,000 tons; recent capital improvements include the redesign of heap leaching operations to a capacity of 30,000 tons of ore per month.
TALC			
Cyprus Mines Corp.	Panamint Mine, CA	Proposed to resume mining at mine in Death Valley National Monument; plans to remove 3.6 million tons of overburden to mine 97,000 tons of talc at the mine between Warm Spring and Galena Canyon.	Reorientation of the pit is necessary to stabilize the highwall (slumping forced shutdown in October 1981) and permit miners to safely reenter the workings; the revised plan involves virtually the same total amount of surface disturbance.
TITANIUM			
E.I. du Pont de Nemours & Co., Inc.	Edgemoor, DE	Planned 70 percent expansion of rutile-paper-slurry-grade titanium dioxide capacity.	Company officials believe the product to be less expensive than amatase-grade titanium dioxide currently used for paper coating.

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SELECTED NEW CONTRACTS, INVESTMENTS, EXPANSIONS AND EXPLORATION ACTIVITIES: FOREIGN

OCTOBER - NOVEMBER 1982*

COUNTRY Commodity/Company	Operation and/or Location	Action or Event	Notes
BOLIVIA			
TUNGSTEN:			
Churquini Enterprises Ltd. (wholly owned subsidiary of Anschutz Mining Corp.)	El Chicote Grande Mine	Developing one of largest tungsten deposits in the world; current production from a small rehabilitated vintage mill is about 20 metric tons per month of concentrate.	Maximum production of 100,000 mtpy of ore will be reached during late 1983 or early 1984 after a new mill (capacity 500 - 1000 mtpd) goes into operation. During the 1978-81 period, Bolivia accounted for 19 percent of U.S. tungsten imports.
CANADA			
COPPER:			
Canada Development Corporation	Kidd Creek Mines near Timmons, Ontario	Initiated production at most modern copper smelter and refining complex the world.	Plant has a design capacity of 65,000 tpy and can be expanded to 130,000 tpy.
CHILE			
COPPER:			
CODELCO	El Teniente Mine	Initiated production in October using primary crusher.	Will permit mining of hard primary ore.
COLOMBIA			
NICKEL:			
Cerro Matoso S.A. (Empresa Colombiana de Niquel--Colombian Govt. corporation 45%; Hanna Mining Co. 20%; Billiton Overseas Ltd. 35%)	Cerro Matoso	Initiated production at new laterite mine and smelter; smelter capacity is 22,600 tpy of contained nickel.	Smelter producing 1,000 tons per month of nickel in ferronickel; mine reserves of 23 million tons of ore have an avg. grade of about 2.7 percent nickel.
MEXICO			
COPPER:			
Mexicana de Cobre, S.A.	Guaymas, Sonora State	$113 million contract awarded to Marubeni Corp., of Japan, to design, supply equipment, and construct 180,000 tpy electrolytic copper refinery; work to start immediately and be completed early in 1985.	Marubeni granted favorable loan and construction cost credits. Concentrate to come from La Caridad Mine concentrator located at rail center at Nacozari.
ZINC:			
Industrial Minera Mexico, S.A. (IMMSA)	San Luis Potosi, S.L.P. State	Opened new 114,000 tpy electrolytic refinery October 15.	To supply additional zinc concentrate, production at Taxco Mines raised from 2,200 to 3,300 tons of ore per day and at Santa Barbara Mine from 3,000 to 4,800 tons of ore per day.

*Data presented in this table are based on information as of November 30, 1982.

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COUNTRY Commodity/Company	Operation and/or Location	Action or Event	Notes
PAPUA NEW GUINEA			
CHROMITE, COBALT, NICKEL:			
Nord Resources Corp. (U.S.) and Mount Isa (Australia)	Ramu River deposit	Completed pre-feasibility studies; initiated studies on various mine/mill alternatives.	When developed, the mine could produce 200,000 to 400,000 tons of chromite, 2,950 tons of cobalt and 24,950 tons of nickel annually.
TAIWAN			
NICKEL:			
Inco, Ltd.	Taiwan	Planned construction of a nickel reduction plant with a capacity of 7,700 tpy to be built by International Nickel BV of the Netherlands and a Japanese partnership.	Inco will supply the $6 million plant with nickel oxide feed and provide the technology for the facility. The market for nickel in Taiwan is expected to experience a high rate of growth. This facility, which will produce nickel metal in shot and pig form, could supply all of Taiwan's anticipated needs.
YUGOSLAVIA			
COPPER:			
RTB Bor	Veliki Krivelj Mine, Bor	Planned to open mine in November.	Planned eventual production of 30,000 mtpy of copper.

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SELECTED CLOSINGS, POSTPONEMENTS, LAYOFFS AND PRODUCTION DECREASES: UNITED STATES
OCTOBER - NOVEMBER 1982*

COMMODITY/ Company	Operation and/or Location	Action taken, Employees affected	Effective Date	Duration	Notes
BARITE					
Galveston-Houston Co. (parent of DeSoto Mining Co.)	Richwoods Mine, Washington Co., MO	Shut down.	Nov. 23	Permanent	Barite from China is being delivered to Gulf Coast ports at lower cost than barite from Missouri.
CEMENT					
Arizona Portland Cement Co.	Rillito, AZ	42 laid off; output reduced by 40%.	Nov. 6	Indefinite	Continued depressed conditions in the construction industry cited.
Bessemer Cement Co. (owned by Louisville Cement Co.)	Bessemer, PA	Shut down; approx. 220 laid off	October	Permanent	Production was suspended in August.
COPPER					
Copper Range Co.	White Pine, MI	Shut down; 700 laid off.	Oct. 1	Indefinite	Attributed to continued depressed market conditions and mounting material and labor costs. Previous cutbacks occurred in February and June 1982. Firm's new electrolytic refinery will use copper materials currently available for limited production.
Inspiration Consolidated Copper Co.	Gila Co., AZ	Recall of 140 employees halted after smelter fire; 100 laid off until repairs are completed.	Oct. 6	Approx. Dec. 1.	Of the 2,200 employed at Inspiration in December 1981, about 875 have been laid off.
Phelps Dodge Corp.	Douglas, AZ	Shut down; 210 to be laid off.	November	Indefinite	Action due to a lack of concentrates.
FERROALLOYS					
Globe Metallurgical Div.	Beverly, OH	Temporarily suspended ferrosilicon production; 190 workers laid off.	Mid-Nov.	Jan. 1983	Globe's Selma, Alabama operations will not be affected.
The Hanna Mining Co.	Wenatchee, WA	Suspended silicon operations; 86 workers laid off.	Oct. 1	Indefinite	Facility had been operating at a reduced rate since July 15.
International Minerals and Chemical Corp.	Bridgeport, AL & Kimball, TN	Suspended ferrosilicon production; 120 workers laid off.	Nov. 1	Indefinite	Both plants have been operating at reduced rate since the first of the year.
Northwest Alloys, Inc.	Addy, WA	Suspended ferrosilicon production; 52 workers laid off.	Nov. 28	Indefinite	Increased power rates by Bonneville Power Administration cited as cause.

*Data presented in this table are based on information as of November 30, 1982.

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COMMODITY/ Company	Operation and/or Location	Action taken, Employees affected	Effective Date	Duration	Notes
(FERROALLOYS)					
Roane Ltd.	Rockwood, TN	Suspended all standard-grade ferromanganese and silicomanganese production; 100 workers laid off.	Oct. 1	Indefinite	Facility shut down its ferro-silicon furnaces in August. The Elkem Metals Co. is the only current U.S. producer of standard-grade ferromanganese.
Satralloy, Inc.	Steubenville, OH	Suspended all charge chrome production; about 200 workers laid off.	Nov. 5	Indefinite	Macalloy Inc. is currently the only firm producing 50-55 percent charge chrome.
SKW Alloys, Inc.	Niagara Falls, NY	Suspended all ferro-silicon & ferrochromium-silicon production; about 200 workers laid off.	Oct. 1	Until Jan. 1983	Also operating its Calvert City, KY plant at about one-sixth of capacity.
IRON ORE and STEEL					
Babcock & Wilcox Co., Tubular Products Group	Milwaukee, WI	Additional 340 laid off.	Nov. 30	Indefinite	Total of 1,000 laid off.
Bethlehem Steel Corp.	Baltimore, MD	Shut down hot mill, tin mill, and pipe mill; 2,000 laid off.	October	Temporary	A total of 6,500 Bethlehem employees are out of work.
	Burns Harbor, IN	Shut down most of the primary steelmaking operations; 1,000 laid off.	Nov. 25	Dec. 11	
Cameron Iron Works, Inc.	Houston, TX	930 laid off.	Nov. 5	Indefinite	About 30% of employees now laid off.
Crucible Alloy & Stainless Div., Colt Industries, Inc.	Midland, PA	200 laid off.	Oct. 15	Permanent	Most of remaining employees laid off. Production ceased earlier in year. Plant had employed over 4,500.
Cyclops Corp. Specialty Steel Div.	Bridgeville, PA	Suspended steel bar operations; 400 laid off.	Oct. 1	End of 1982	Reduced demand for products and foreign competition cited.
The Hanna Mining Co.	National Steel Pellet Co., Keewatin, MN	Extended shutdown through end of year.	Nov. 20	Indefinite	
	Butler Taconite, Nashwauk, MN	Extended shutdown through end of year.	Nov. 20	Indefinite	
Harsco Corp., Harsco Taylor-Wharton Div.	Harrisburg, PA	Shut down.	Nov. 10	Indefinite	Production of seamless cylinders at the plant will be transferred to the company's Easton plant until the economy improves.

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COMMODITY/ Company	Operation and/or Location	Action taken, Employees affected	Effective Date	Duration	Notes
(IRON ORE and STEEL)					
Inland Steel Co.	East Chicago, IN	Shut down open hearth steelmaking; 350 laid off.	Oct. 13	Indefinite	Lack of steel orders with no increase expected was cited as the main reason for the closure. As of Oct. 13 3,700 Inland employees were on indefinite layoff, 200 were on furlough, and another 6,000 hourly and salaried employees were working shortened weeks.
Kaiser Steel Corp.	Eagle Mountain, CA	Shut down mining and ore-crushing operations, concentrating plant.	Oct. 8/9 for mining and ore crushing; Nov. 30 for concentrating.	Permanent	All production facilities closed permanently; shipments of stockpiled concentrates may continue. This represents a capacity loss of 4 million tons of iron ore products per year and an employment loss of nearly 1,000 over the past year.
	Fontana, CA	Shut down steelmaking mill; 600 laid off.	Oct. 17	At least 3 weeks	Attributed to weak demand; units will be closed permanently in 1983; coke ovens will be closed by end of 1982, laying off 400.
National Forge Co.	Irvine, PA	Shut down operations of forge and steel melt department; 225 of the plant's 600 workers laid off.	Oct. 13	Temporary	
National Steel Corp.	Weirton, WV	200 hourly workers and 60 salaried workers laid off.	Oct. 22	Indefinite	A total of 3,800 of 10,900 on layoff; company plans permanent reduction of salaried employees by 400. The plant is being considered for an Employee Stock Ownership Plan since National announced earlier in the year that it would not invest any more capital in the plant.
Pickands Mather & Co.	Hibbing Taconite Co., Hibbing, MN	Shut down temporarily.	Late Nov.	1 week	Reducing stockpiles.
Republic Steel Corp.	Cleveland and Warren, OH	450 laid off at Cleveland plant; 440 laid off at Warren.	Nov. 5 & Nov. 12	Indefinite	
Reserve Mining Co.	Babbitt and Silver Bay, MN	Extended shutdown through end of year.	Nov. 20	Until Jan. 2, 1983	To recall 1,000 by Jan. 2.
Roblin Steel Co.	Buffalo, NY	Shut down.	Mid-Nov.	Jan. 4, 1983	

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COMMODITY/ Company	Operation and/or Location	Action taken, Employees affected	Effective Date	Duration	Notes
(IRON ORE and STEEL)					
U.S Steel Corp.	Minntac plant, MN	Extended shutdown for remainder of 1982; will reopen at partial capacity Jan. 16, 1983; recall of 1,300 employees planned.	October	Jan. 16, 1983	Although plant closed June 4, operations were to have resumed after several months; Minntac will have produced only about 18% of its rated capacity of 18.5 million tpy of iron ore pellets this year.
MAGNESIUM					
Northwest Alloys Inc.	Addy, WA	On Nov. 1, shut down two furnaces at 25,000 tpy primary magnesium plant; 59 laid off in October. Halted ferrosilicon production Nov. 28; 52 laid off.	Oct./Nov.	Indefinite	Low demand for its products by aluminum and steel industries cited. Repair work being done at both plants.
MOLYBDENUM					
AMAX Inc.	Climax and Henderson Mines, CO	Extended shutdown; 2,200 will remain laid off.	Nov. 8	April 4	The two mines produce 40% of the world's molybdenum, which is used to strengthen steel. Current temporary shutdown began Sept. 18 at Climax and Oct. 2 at Henderson for a 3-week period; this was extended in mid-October to Jan. 3 and now to April 4. Mines are scheduled to operate at about 30% of capacity next year.
SULFUR					
Occidental Chemical Co.	Long Point, TX	Shut down mine.	Nov. 5	Indefinite	Increasing production costs and declining reserves cited; the mine has produced over 9 million metric tons of sulfur during 26 years of continuous operation.
TALC					
Cyprus Industrial Minerals Co.	Yellowstone Mine, near Ennis, MT	44 laid off.	Oct. 17	Indefinite	Reduction attributed to the large inventory of talc that has accumulated over the past 2 years in anticipation of an expected economic recovery; a new talc sorting facility is under construction and is expected to be completed in late 1983.

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COMMODITY/ Company	Operation and/or Location	Action taken, Employees affected	Effective Date	Duration	Notes
TITANIUM					
Oregon Metallurgical Corp.	Albany, OR	Reduced output of titanium sponge metal.	Oct. 10	Indefinite	Production at less than 25% of capacity by mid-November.
RMI Inc.	Ashtabula, OH	Reduced output of titanium scrap metal.	Oct. 10	Indefinite	Production at less than 30% of capacity.
Titanium Metals Corp. of America	Henderson, NY	Reduced output of titanium scrap metal.	Oct. 10	Indefinite	Production slightly over 30% of capacity.
TUNGSTEN					
Utah International Inc.	Springer Mine (and ammonium para-tungstate plant) Imlay, NV	Shut down; 140 laid off.	Oct. 29	Indefinite	On standby until demand and prices improve.
URANIUM / VANADIUM					
Atlas Minerals Corp. and Union Carbide Corp.	Colorado Plateau region	250 laid off; Union Carbide postponed reopening of Uravan mill in Montrose County, Colorado.	November	Indefinite	Attributed to continuing depressed markets and strong competition from imports; only about 40% of the normal Plateau work-force of 1,500 remains employed.
ZINC					
ASARCO Inc.	Corpus Christi, TX	Shut down 104,000 mtpy electrolytic zinc refinery; 325 laid off.	Oct. 30	Indefinite	Lack of feed material cited; the refinery represents 27% of U.S. primary zinc smelter/refinery capacity.
National Zinc Co.	Bartlesville, OK	Reduced primary zinc production by 2,000 metric tons per month due to strike.	Nov. 1	Indefinite	Plant operating at about 55% of its 91,000 mtpy capacity.
U.S. Steel Corp.	Jefferson City, TN	Shut down zinc mine after second rejection by mine workers of company-sought concessions on pay and benefits; 175 laid off.	Oct. 29	Indefinite	Two months ago the union rejected a similar company-sought concession, resulting in the company's implementing a 3-day-per-week schedule. Operations will not resume until zinc market improves. In 1981, the mine was the sixth largest U.S. zinc producer.

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SELECTED CLOSINGS, POSTPONEMENTS, LAYOFFS AND PRODUCTION DECREASES: FOREIGN

OCTOBER - NOVEMBER 1982*

COUNTRY Commodity/Company	Operation and/or Location	Action taken, Employees affected	Effective Date	Duration	Notes
CANADA					
NICKEL:					
INCO Ltd.	Sudbury, Ontario	Second extension of shutdown.	Oct./Nov.	April, 1983	Attributed to continuing depressed demand for nickel and copper, and the resulting need to control inventory levels and reduce cash outflow. The company plans to reduce Sudbury workforce from the current 12,000 to 9,500 by 1988; result will be a reduction of effective capacity at Sudbury by 40 million pounds to 240 million pounds. Inco's finished nickel inventories were 143 million pounds as of Sept. 30, down from 157 million pounds on June 30.
GERMANY, FEDERAL REPUBLIC OF					
ALUMINUM:					
Alcan Aluminiumwerke GmbH.	Ludwigshafen	Announced shutdown of 45,000 mtpy smelter due to high power costs; complete shutdown by March 31, 1983.	Oct. 1	Permanent	Shutdown postponed to allow local city officials to mediate power cost reductions. If no progress is made, plant will close completely by Dec. 31.
GHANA					
ALUMINUM:					
Volta Aluminum Corp. (VALCO) (Kaiser 90%, Reynolds 10%)	Tema	Shut down two 20,000 mtpy potlines at request of Ghanian government due to severe drought in area.	October	Indefinite	One potline scheduled to shut down in June was deferred at request of government.
JAMAICA					
BAUXITE:					
Alumina Partners of Jamaica (AIPART - joint venture of Kaiser, Reynolds and Anaconda)	Nain, St. Elizabeth Parish	Reduced operating rate to one-half of 1.5 million tpy capacity.	October	Indefinite	Government concessions granted to avert complete plant closure were not made public.
Jamaica Reynolds Bauxite Partners (Jamaican Govt. 51%, Reynolds Metals 49%)	Lyford, St. Ann Parish	Reduced production to 18% of its 2.5 million tpy capacity; 420 of 600 laid off.	Oct 1	Indefinite	Because of weak market demand for aluminum, company has been gradually reducing output since 1981.

*Data presented in this table are based on information as of November 30, 1982.

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COUNTRY Commodity/Company	Operation and/or Location	Action taken, Employees affected	Effective Date	Duration	Notes
(JAMAICA)					
(BAUXITE):					
Kaiser Jamaica Bauxite Co. (Jamaican Govt. 51%, Kaiser Aluminum and Chemical Corp. 49%)	Water Valley, St. Ann Parish	Reduced production to 25% of 4.2 million tpy capacity; 169 laid off.	Oct. 4	Indefinite	
LIBERIA					
IRON ORE:					
National Iron Ore Co.	Mano River Mine	Forced to reduce production to approx. 750,000 metric tons in 1982 as a result of flooding from burst tailings dam.	Oct. 6	---	46 persons died in the disaster.
NEW ZEALAND					
ALUMINUM:					
South Pacific Ltd. (Fletcher Challenge 50%, Gove Aluminium Australia 25%, Pechiney 25%)	Dunedin (Aramoana)	Deferred proposed 200,000 mtpy smelter.	October	Indefinite	Depressed aluminum market and world economy cited.
PERU					
STEEL:					
Empresa Siderurgica del Peru (SIDERPERU)	Chimbote	Shut down.	September	November	Excess stocks (158,000 tons or 8-month supply) and depressed world markets cited. Declining sales also attributed to reduction in import tariffs.
SIERRA LEONE					
TITANIUM:					
Sierra Rutile, Ltd.	Near Gbangbima, in the Mayamba and Benthe districts	Shut down mining of rutile, a mineral consisting essentially of titanium dioxide; nominal capacity of the operation is 110,000 tpy.	Sept./Oct.	Indefinite	Due to the depressed market for titanium concentrates, shipments will be made from stocks, at least through 1982. Nord Resources Group, which owns 15% of Sierra Rutile, Ltd., announced on Oct. 26 that it would purchase Bethlehem Steel's 35% share. The suspension in mining is not expected to significantly affect the U.S. titanium industry.

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MINERAL DATA SERIES

Commodities

ALUMINUM

CHROMIUM

COBALT

COPPER

IRON ORE

LEAD

MANGANESE

NICKEL

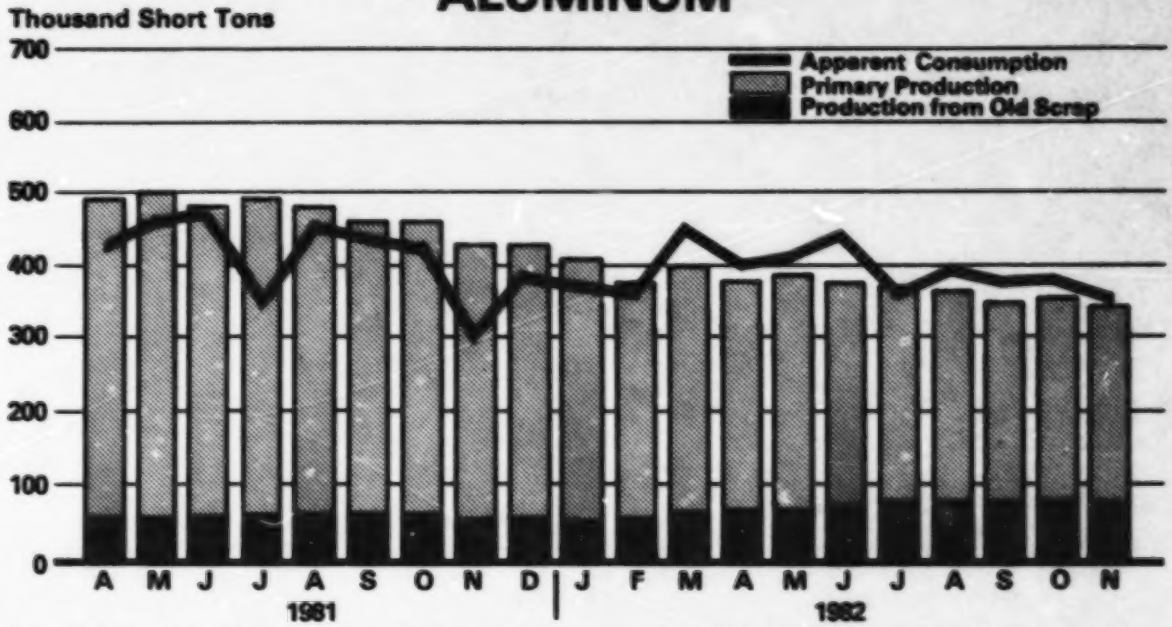
PLATINUM-GROUP METALS

STEEL

TITANIUM METAL

ZINC

ALUMINUM



Apparent Consumption = Primary Production + Production from Scrap + (Imports – Exports) + (Beginning Inventories – Ending Inventories).

YEAR OR MONTH	APPARENT CONSUMPTION	PRODUCTION		IMPORTS	EXPORTS	INVENTORIES		PRICE ¢/LB.[2]
		PRIMARY	FROM OLD SCRAP			PRIVATE[1]	GOVERNMENT	
1978	6,045	4,804	575	1,080	520	2,747	2	54.0
1979	5,888	5,023	614	840	773	2,563	2	61.0
1980	5,065	5,130	680	713	1,483	2,538	2	71.6
1981	5,137	4,948	886	935	867	3,303	2	76.0
1981:								
JAN	371	445	46	65	113	2,610	2	76
FEB	394	404	44	71	73	2,662	2	76
MAR	478	448	57	104	89	2,704	2	76
APR	418	431	57	72	99	2,747	2	76
MAY	451	441	55	88	80	2,800	2	76-80
JUNE	479	420	57	77	59	2,816	2	76-80
JULY	339	426	60	81	62	2,982	2	76-80
AUG	457	416	65	84	47	3,043	2	76-80
SEP	438	393	63	81	49	3,093	2	76-80
OCT	428	396	62	81	66	3,138	2	76-80
NOV	297	364	53	64	60	3,262	2	76-80
DEC	387	364	57	67	60	3,303	2	76-77
1982:								
JAN	374	351	54	60	59	3,335	2	76-77
FEB	357	310	58	90	55	3,371	2	76-77
MAR	448	336	63	88	81	3,329	2	76-77
APR	393	319	64	82	59	3,342	2	76-77
MAY	409[r]	321	64	77	53	3,342[r]	2	76-77
JUNE	434	300	79[r]	90	89	3,288	2	76-77
JULY	366	297	82	64	73	3,312[e]	2	76-77
AUG	400[e]	287	82	102	73	3,310[e]	2	76-77
SEP	368[e]	271	81	77	61	3,310[e]	2	76-77
OCT[e]	373	276	83	76	69	3,310	2	76
NOV[e]	357	286	81	70	60	3,310	2	NA

See footnotes at end of section.
Data prepared November 24.

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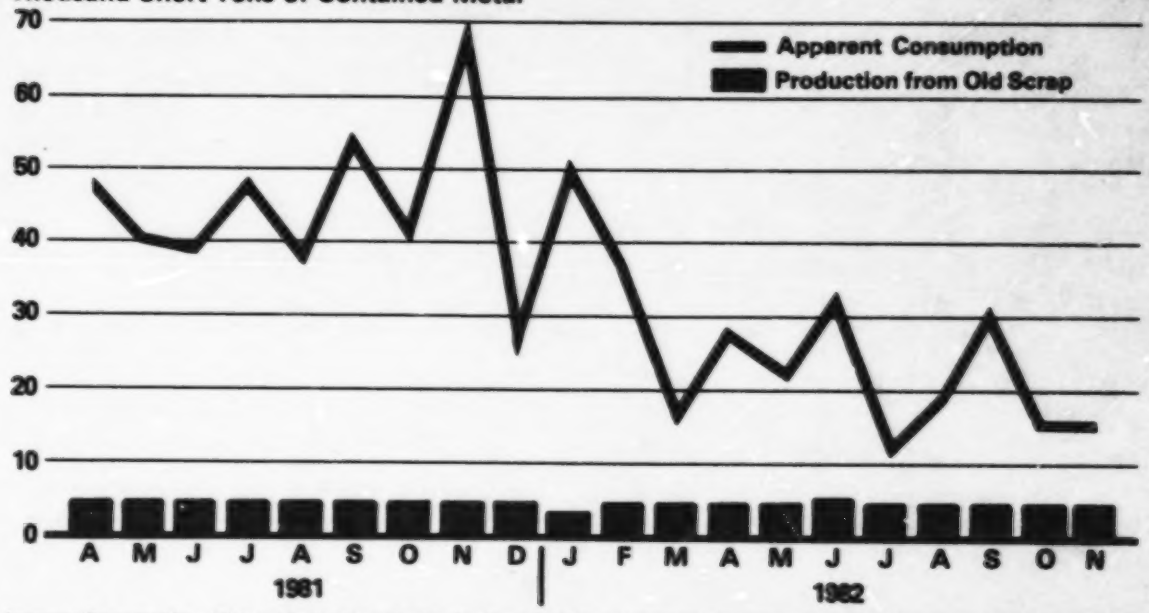
CHROMIUM

Thousand Short Tons of Contained Metal



Apparent Consumption = Primary Production + Production from Old Scrap + (Imports-Exports) + (Beginning Inventories-Ending Inventories).

YEAR OR MONTH	APPARENT CONSUMPTION	REPORTED CONSUMPTION[1]	PRODUCTION		IMPORTS[3]	EXPORTS[3]	INVENTORIES		PRICE ¢/M.T.[5]
			PRIMARY	FROM OLD SCRAP[2]			PRIVATE[4]	GOVERNMENT	
1978	511	412	0	46	421	19	465	1,641	105
1979	604	446	0	60	421	18	324	1,641	110
1980	558	365	0	49	454	20	249	1,641	110
1981	515	336	0	51	494	27	252	1,641	110
1981:									
JAN	18	25	0	4	26	1	261	1,641	110
FEB	58	30	0	4	42	1	248	1,641	110
MAR	43	33	0	4	35	1	243	1,641	110
APR	48	32	0	4	34	1	232	1,641	110
MAY	40	31	0	4	36	1	231	1,641	110
JUNE	39	33	0	4	48	1	243	1,641	110
JULY	48	29	0	4	53	1	251	1,641	110
AUG	38	27	0	4	35	10	242	1,641	110
SEP	54	28	0	4	45	1	236	1,641	110
OCT	40	24	0	4	70	7	263	1,641	110
NOV	70	21	0	4	64	1	280	1,641	110
DEC	25	23	0	4	14	1	252	1,641	110
1982:									
JAN	51'	21	0	3'	39	3	240	1,641	110
FEB	37	23	0	4	28	1	234	1,641	110
MAR	17	23	0	4	16	1	236	1,641	110
APR	28	22	0	4	13	1	224	1,641	110
MAY	23	20	0	4	12	0	217	1,641	110
JUNE	32'	19	0	5'	31	0	221'	1,641	110
JULY	11	16	0	4	22	0	236	1,641	110
AUG	19	18	0	4	17	1	237	1,641	110
SEP[e]	31	20	0	4	13	1	222	1,641	110
OCT[e]	16	20	0	4	13	1	222	1,641	110
NOV[e]	16	20	0	4	13	1	222	1,641	110

See footnotes at end of section.
Data prepared November 24.

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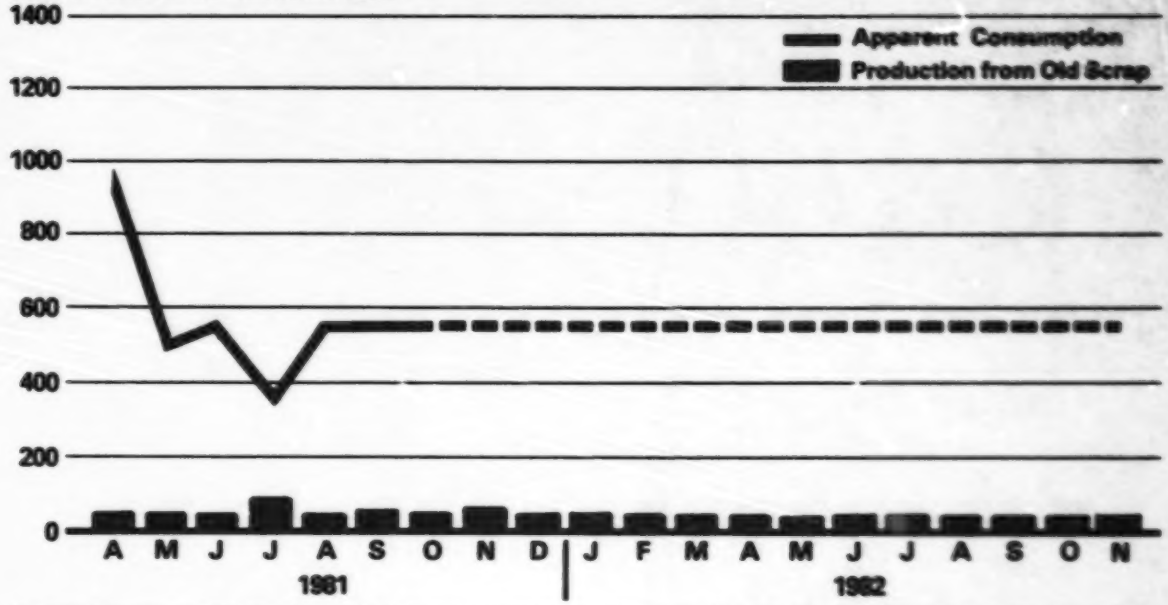
COBALT

Short Tons of Contained Metal



Apparent Consumption = Primary Production + Production from Old Scrap + (Imports-Exports) + (Beginning Inventories-Ending Inventories).

YEAR OR MONTH	APPARENT CONSUMPTION	REPORTED CONSUMPTION	PRODUCTION		IMPORTS	EXPORTS[2]	INVENTORIES		PRICE ¢/LB.[4]
			PRIMARY	FROM OLD SCRAP[1]			PRIVATE[3]	GOVERNMENT	
1978	10,182	9,997	0	518	9,515	774	3,010	20,401	11.53
1979	9,403	8,701	0	585	9,999	363	3,828	20,401	24.58
1980	8,527	7,661	0	582	8,151	292	3,753	20,401	25.00
1981	6,266	5,840	0	486	7,797	417	4,188	21,586[5]	19.73
1981:									
JAN	483	548	0	32	382	41	1,946	20,401	25
FEB	616	483	0	65	565	15	1,946	20,401	25
MAR	549	586	0	53	468	23	1,895	20,401	20
APR	957	532	0	51	842	22	1,810	20,401	20
MAY	516	520	0	47	450	69	1,723	20,401	20
JUNE	559	468	0	42	474	46	1,634	20,401	20
JULY	373	381	0	75	351	44	1,643	20,401	20
AUG	555	422	0	47	380	20	1,485	20,401	17.88
SEP	549	446	0	58	471	51	1,424	20,401	17.25
OCT	1,322[6]	435	0	53	1,223	35	1,343	20,401[6]	17.25
NOV	935[6]	402	0	63	1,142	19	1,594	20,401[6]	17.25
DEC	1,212[6]	411	0	44	1,109	48	1,487	20,401[6]	17.25
1982:									
JAN	540[6]	472	0	44	441	17	1,415	20,401[6]	17.25
FEB	1,004	460	0	39	1,008	16	1,442	20,401[6]	12.50
MAR	1,203[6]	517	0	38	900	27	1,150	20,401[6]	12.50
APR	418[6]	405	0	36	492	17	1,243	20,401[6]	12.50
MAY	430[6]	388	0	31	443	24	1,283	20,401[6]	12.50
JUNE	956[6]	393	0	39	947	48	1,245	21,896	12.50
JULY	520[r]	325[r]	0	38	477	29	1,211[r]	21,896	12.50
AUG	315[6]	382	0	37	343	24	1252	21,856	12.50
SEP	361[e]	350[e]	0	35[e]	305	31	1200[e]	21,896	12.50
OCT[e]	410	400	0	40	400	30	1,200	21,896	NA
NOV[e]	410	400	0	40	400	30	1,200	21,896	NA

See footnotes at end of section.

Data prepared November 24.

WILLIAM S. KIRK (202) 634-1038

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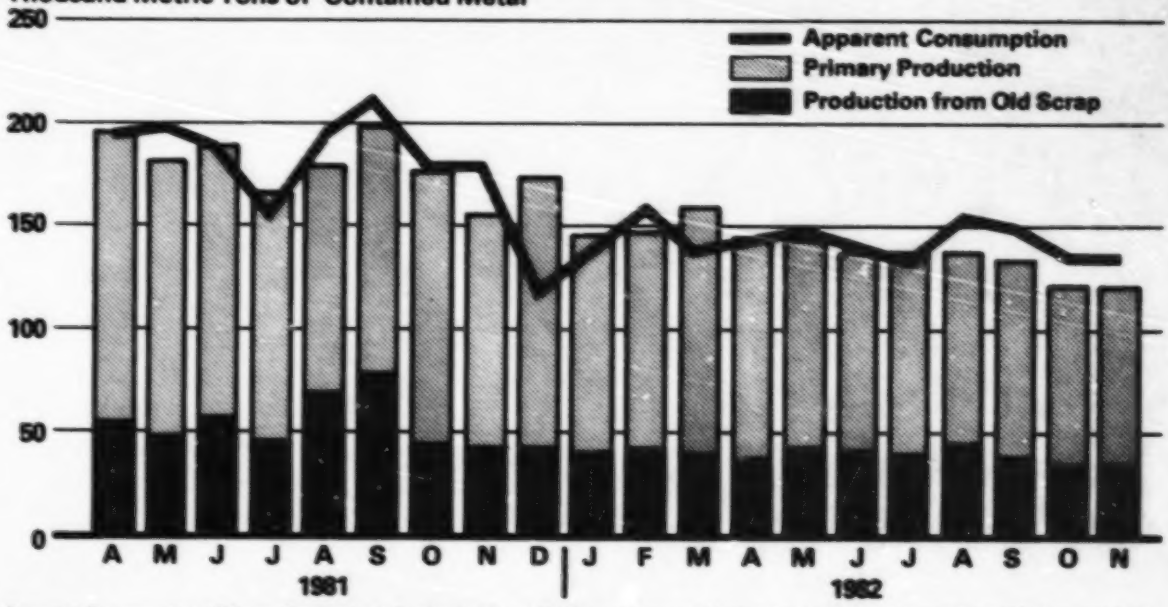
COPPER

Thousand Metric Tons of Contained Metal



Apparent Consumption = Primary Production + Production from Old Scrap + (Imports-Exports) + (Beginning Inventories-Ending Inventories).

YEAR OR MONTH	APPARENT CONSUMPTION	PRODUCTION[1] PRIMARY	PRODUCTION[1] FROM OLD SCRAP	IMPORTS[2]	EXPORTS[2]	INVENTORIES PRIVATE[3]	INVENTORIES GOVERNMENT	PRICE ¢/LB.[4]
1978	2,272	1,449	502	424	210	415	21	86.5
1979	2,324	1,515	604	226	204	232	20	93.3
1980	2,052	1,211	613	460	160	294	20	102.4
1981	2,192	1,544	598	358	137	465	20	85.1
1981:								
JAN	186	126	45	24	15	297	20	88.6
FEB	196	125	45	29	12	288	20	86.1
MAR	197	140	53	23	18	289	20	87.4
APR	197	140	53	27	11	301	20	88.0
MAY	200	132	48	23	11	293	20	85.8
JUNE	189	133	54	35	13	313	20	85.2
JULY	153	121	44	32	9	348	20	84.4
AUG	194	110	67	38	9	360	20	87.4
SEP	218	122	77	38	12	357	20	84.7
OCT	177	129	46	32	9	368	20	82.3
NOV	178	113	42	31	11	385	20	81.2
DEC	122	130	42	24	10	449	20	80.3
1982:								
JAN	132	106	40	20	8	475	20	78.6
FEB	156	105	42	17	7	476	20	78.8
MAR	137	117	41	16	9	504	20	75.9
APR	143	105	39	22	10	517	20	76.3
MAY	150	99	44	23	12	521	20	77.9
JUNE	139	94	43	33	13	539	20	71.5
JULY	127	99	40	29	14	586	20	71.1
AUG	156	92	46	21	13	556	20	71.0
SEP*	151	95	40	25	10	555	20	71.1
OCT*	130	85	35	25	10	580	20	72.4
NOV*	130	85	35	20	10	580	20	NA

See footnotes at end of section.
Data prepared November 24.

W. C. BUTTERMAN (202) 634-1071

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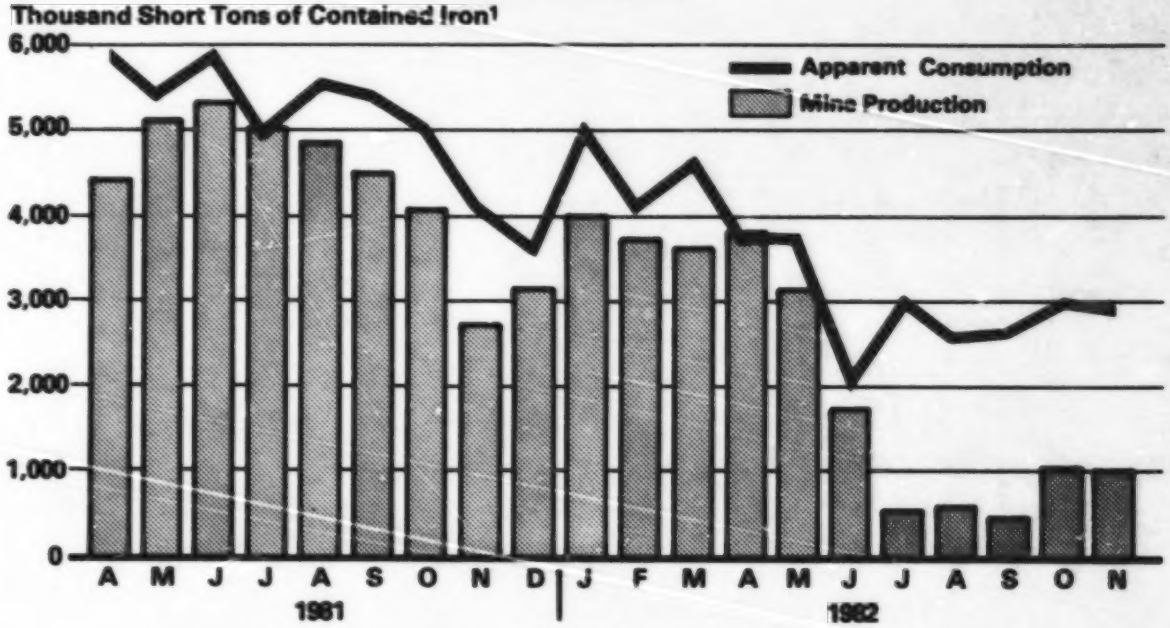
IRON ORE



Apparent Consumption = Mine Production + (Imports – Exports) + (Beginning Stocks – Ending Stocks).

YEAR OR MONTH	APPARENT CONSUMPTION	REPORTED CONSUMPTION[2]	MINE PRODUCTION[3]	IMPORTS	EXPORTS	INDUSTRY STOCKS[4]	PRICE[5] ¢/S.T.
1978	80,900	82,100	56,800	23,700	2,900	38,400	52.32
1979	79,500	81,100	60,100	23,800	3,600	39,200	58.40
1980	63,200	63,100	49,100	17,700	4,000	38,800	65.36
1981	64,800	67,000	52,400	20,000	3,900	42,500	71.88
1981:							
JAN	5,399	6,115	4,208	912	26	38,481	71.88
FEB	6,207	5,734	4,270	965	2	37,507	71.88
MAR	7,209	6,556	4,763	822	49	35,834	71.88
APR	5,912	6,204	4,430	1,265	493	35,125	71.88
MAY	5,411	6,238	5,126	2,047	610	36,275	71.88
JUNE	5,900	5,759	5,309	2,737	500	37,922	71.88
JULY	4,912	5,660	5,020	2,153	419	39,764	71.88
AUG	5,571	5,662	4,841	2,902	478	41,458	71.88
SEP	5,444	5,439	4,503	1,827	309	42,036	71.88
OCT	5,023	4,877	4,043	1,803	249	42,609	71.88
NOV	4,128	4,495	2,759	1,431	233	42,438	71.88
DEC	3,635	4,260	3,126	1,119	541	42,507	71.88
1982:							
JAN	5,050	3,893	4,012	1,150	1	42,618	71.88
FEB	4,070	3,651	3,700	718	1	42,957	71.88-78.57
MAR	4,679	4,001	3,616	456	1	42,368	71.88-77.58
APR	3,715	3,449	3,809	545	168	42,830	71.88-77.58
MAY	3,737	3,455	3,104	846	278	42,765	71.88-77.58
JUNE	1,976	3,064	1,764	1,316	430	43,439	71.88-77.58
JULY	3,015	3,320	590	1,094	231	41,847	71.88-77.58
AUG	2,548	3,100	613	1,080	40	40,952	71.88-77.58
SEP	2,645	3,000	527	1,005	357	39,482	71.88-77.58
OCT[e]	3,000	2,900	1,040	1,000	200	38,276	71.88-77.88
NOV[e]	2,800	2,800	1,025	900	200	37,887	71.88-77.88

See footnotes at end of section.
Data prepared November 24.

F. L. KLINGER (202) 634-1023

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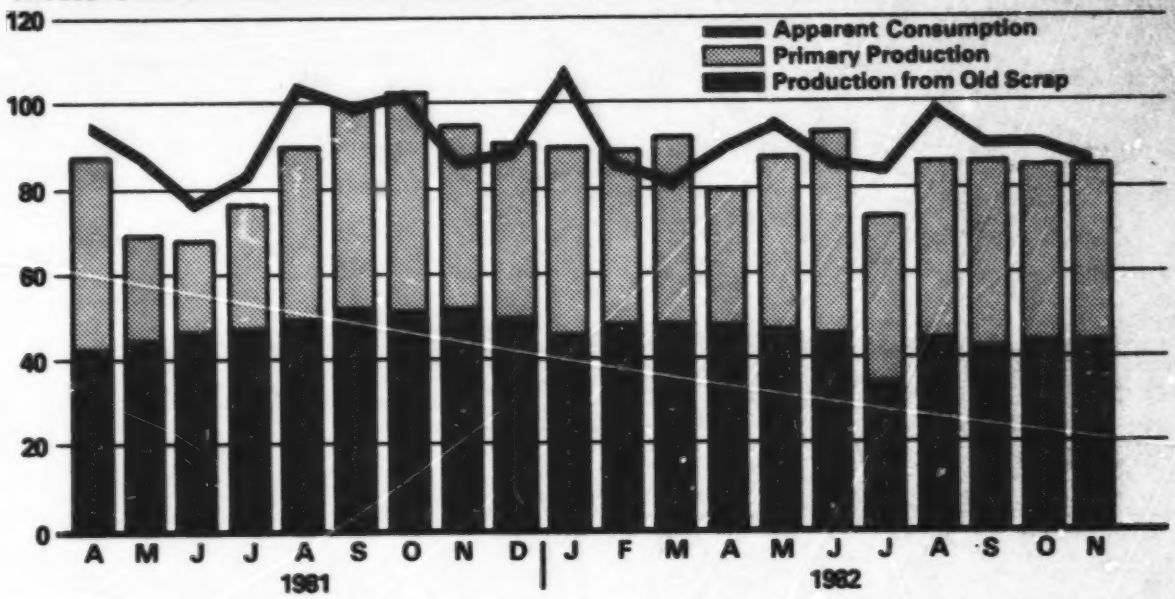
LEAD

Thousand Metric Tons of Contained Metal



Apparent Consumption = Primary Production + Production from Old Scrap + (Imports-Exports) + (Beginning Inventories-Ending Inventories).

YEAR OR MONTH	APPARENT CONSUMPTION	PRODUCTION		IMPORTS	EXPORTS	INVENTORIES		PRICE ¢/LB.
		PRIMARY	FROM OLD SCRAP[1]			PRIVATE	GOVERNMENT	
1978	1,432	568	650	230	8	143	545	33.65
1979	1,368	578	673	184	11	199	545	52.64
1980	1,065	548	581	82	164	181	545	42.46
1981	1,132	498	578	101	23	203	545	36.53
1981:								
JAN	88	53	46	9	1	170	545	33.79
FEB	98	48	44	6	1	169	545	30.42
MAR	103	52	44	8	5	165	545	35.06
APR	96	45	42	7	4	159	545	37.52
MAY	88	25	44	8	1	146	545	36.41
JUNE	77	22	46	6	3	140	545	37.97
JULY	83	29	47	8	1	140	545	40.99
AUG	104	41	49	14	1	139	545	43.89
SEP	98	47	52	11	1	151	545	40.32
OCT	102	51	51	9	1	159	545	37.04
NOV	87	42	52	8	1	173	545	33.88
DEC	90	42	49	6	3	177	545	31.07
1982:								
JAN	107	45	45	5	5	160	545	29.67
FEB	85	41	48	5	11	158	545	28.70
MAR	80	44	48	6	17	159	545	27.64
APR	90	32	48	8	4	153	545	26.06
MAY	96	41	46	7	8	143	545	26.09
JUNE	87	48	45	10	2	157	545	24.76
JULY	84	39	34	8	3	151	545	27.18
AUG	99	42	44	8	1	145	545	25.82
SEP	89	44	42	10	1	151	545	25.32
OCT[e]	91	42	43	7	2	160	545	23.19
NOV[e]	87	42	43	6	4	150	545	NA

See footnotes at end of section.
Data prepared November 24.

WILLIAM WOODBURY (202) 634-1053

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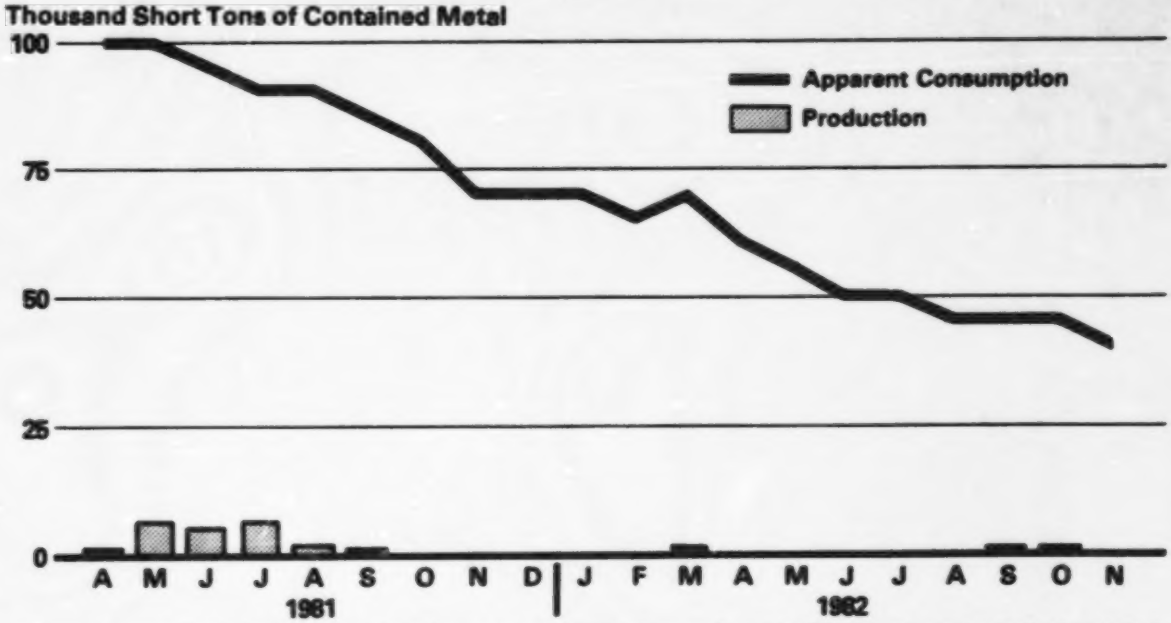
MANGANESE



Apparent Consumption = Primary Production + Production from Old Scrap + (Imports-Exports) + (Beginning Inventories-Ending Inventories).

YEAR OR MONTH	APPARENT CONSUMPTION	PRODUCTION		IMPORTS	EXPORTS	INVENTORIES		PRICE ¢/LTU[3]
		PRIMARY[1]	FROM OLD SCRAP			PRIVATE[2]	GOVERNMENT	
1978	1,363	38	0	882	117	811	2,640	1.40
1979	1,250	31	0	952	59	749	2,376	1.40
1980	1,029	23	0	880	52	710	2,297[4]	1.70
1981	1,027	24	0	916	49	702	2,169	1.72
1981:								
JAN	95	0	0	27	2	651[4]	2,286	1.70
FEB	90	1	0	86	4	647	2,283	NA
MAR	105	1	0	60	5	614	2,267	NA
APR	100	1	0	79	10	602	2,249	NA
MAY	100	6	0	124	5	652	2,224	NA
JUNE	95	5	0	88	5	658	2,211	NA
JULY	90	6	0	76	4	649	2,208	1.72
AUG	90	2	0	62	3	628	2,200	1.72
SEP	85	1	0	63	5	616	2,186	1.72
OCT	80	0	0	57	2	596	2,181	1.72
NOV	70	0	0	81	2	610	2,176	1.72
DEC	70	0	0	113	2	658	2,169	1.72
1982:								
JAN	70	0	0	85	2	683	2,157	NA
FEB	65	0	0	55	1	672	2,157	NA
MAR	70	0	0	71	3	671	2,156	NA
APR	60	0	0	62	3	673	2,153	NA
MAY	55	1	0	25	6	640	2,151	NA
JUNE	50	0	0	65	2	657	2,147	NA
JULY	50	0	0	39	2	645	2,146	NA
AUG	45	0	0	37	3	635	2,145	NA
SEP	45	1	0	15	2	607	2,142	NA
OCT[e]	45	1	0	50	3	611	2,141	NA
NOV[e]	40	0	0	50	3	619	2,140	NA

See footnotes at end of section.
Data prepared November 24.

THOMAS S. JONES (202) 634-7081

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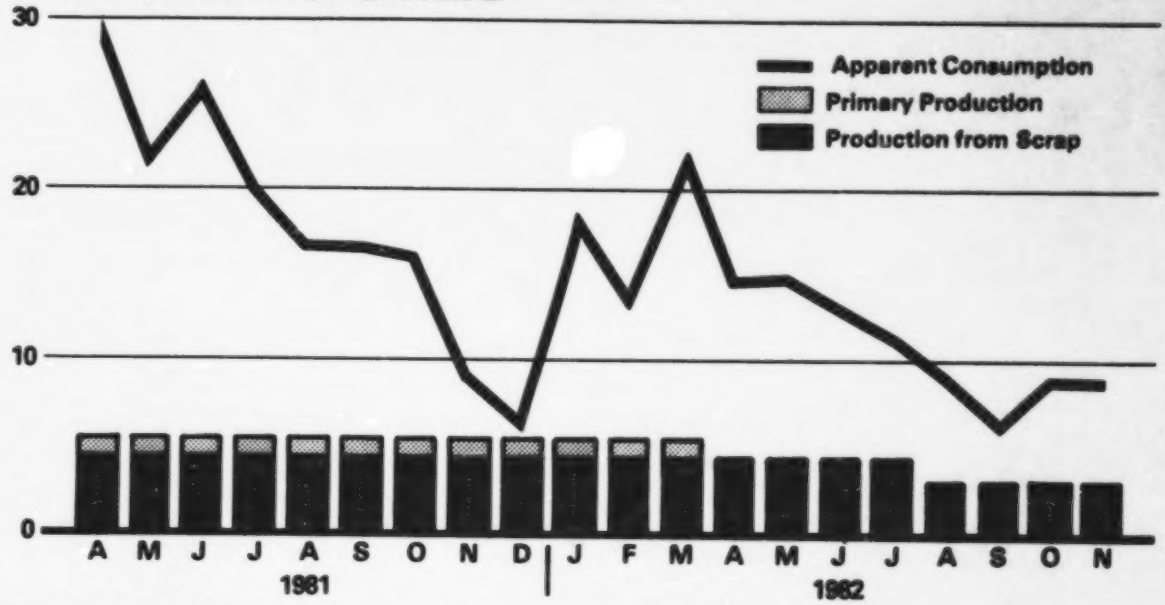
NICKEL

Thousand Short Tons of Contained Metal



Apparent Consumption = Primary Production + Production from Scrap + (Imports – Exports) + (Beginning Inventories – Ending Inventories).

YEAR OR MONTH	APPARENT CONSUMPTION	REPORTED CONSUMPTION	PRODUCTION		IMPORTS	EXPORTS[3]	INVENTORIES			PRICE[5] ¢/LB
			PRIMARY[1]	FROM SCRAP[2]			CONSUMER	PRODUCERS[4]	GOVERNMENT	
1978	273	181	11	44	234	17	20	NA	39	2.08
1979	224	196	12	57	177	24	20	29	37	2.49
1980	206	156	11	49	189	20	15	60	34	3.41
1981[e]	196	145	10	52	200	20	23	100	32	3.43
1981:										
JAN	21.6	14	1	4	16	0.4	11	NA	34	3.46
FEB	32.2	13	1	4	29	0.8	12	NA	34	3.46
MAR	18.0	14	1	4	16	3.0	12	NA	34	3.46
APR	30.0	13	1	4	26	2.0	12	NA	33	3.46
MAY	22.0	13	1	4	19	2.0	12	NA	33	3.46
JUNE	26.0	12	1	4	23	1.0	13	NA	33	3.46
JULY	20.1	9	1	4	14	0.9	12	NA	32	3.46
AUG	16.4	10	1	4	13	1.6	12	NA	32	3.46
SEP	16.4	10	1	4	14	1.6	11	NA	32	3.46
OCT	16.2	9	1	4	15	2.8	10	NA	32	3.46
NOV	9.0[6]	7	1	4	10	3.0	11	NA	32	3.46
DEC	6.0[6]	8	1	4	14	1.0	19	NA	32	3.20
1982:										
JAN	18.4	8	1	4	16	2.6	19	NA	32	3.20
FEB	12.8	8	1	4	11	3.2	19	NA	32	3.20
MAR	21.8	10	1	4	19	3.2	18	NA	32	3.20
APR	14.3	9	0	4	13	3.7	17	NA	32	3.20
MAY	14.4	8	0	4	11	2.6	15	NA	32	3.20
JUNE	12.6	9	0	4	12	3.4	15	NA	32	3.20
JULY	11.6	6	0	4	10	3.4	14	NA	32	3.20
AUG	9.2	7	0	3	9	2.8	14	NA	32	3.20
SEP	6.1	7	0	3	6	1.9	15	NA	32	3.20
OCT[e]	9.0	7	0	3	8	2.0	16	NA	32	3.20
NOV[e]	9.0	7	0	3	8	2.0	16	NA	32	NA

See footnotes at end of section.
Data prepared November 24.

SCOTT F. SIBLEY (202) 634-1025

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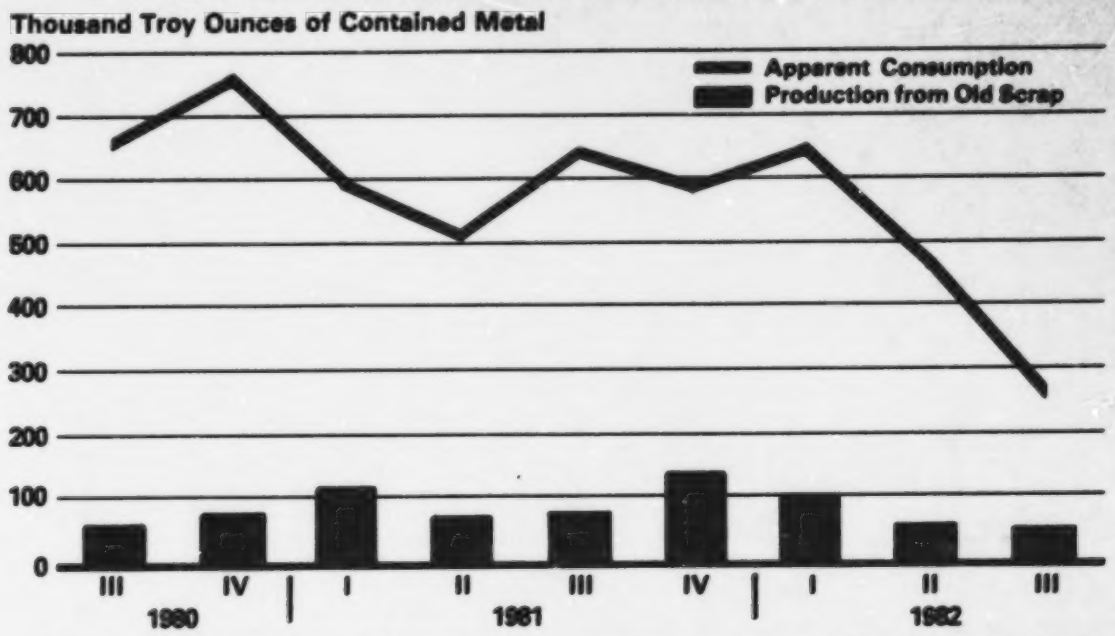
PLATINUM-GROUP METALS

(PLATINUM, PALLADIUM, IRIDIUM, OSMIUM, RHODIUM, RUTHENIUM)



Apparent Consumption = Primary Production + Production from Old Scrap + (Imports-Exports) + (Beginning Inventories-Ending Inventories).

YEAR OR QUARTER	APPARENT CONSUMPTION	PRODUCTION[1]		IMPORTS[3]	EXPORTS[2]	INVENTORIES		PRICE[5]	
		PRIMARY	FROM OLD SCRAP[2]			PRIVATE[4]	GOVERNMENT	PLATINUM	PALLADIUM
								$/OZ.	
1978	2,892	8	257	3,155	668	881	1,725	237	71
1979	2,977	7	309	3,447	886	761	1,725	352	113
1980	2,845	3	331	3,486	762	973	1,725	439	214
1981	2,407	6	392	2,845	862	947	1,725	475	130
1980:									
III	664	NA	61	872	175	841	1,725	438	225
IV	763	NA	80	934	191	901	1,725	475	217
1981:									
I	592	NA	105	719	227	906	1,725	475	174
II	506	NA	78	731	280	947	1,725	475	128
III	649	NA	87	770	206	949	1,725	475	110
IV	591	NA	137	625	169	951	1,725	475	110
1982:									
I	650	NA	94	586	149	931	1,726	475	110
II	475	NA	84	641	219	942	1,726	475	110
III	258	NA	59	614	365	890	1,728	475	110

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Data prepared November 24.

J. ROGER LOEBENSTEIN (202) 634-1038

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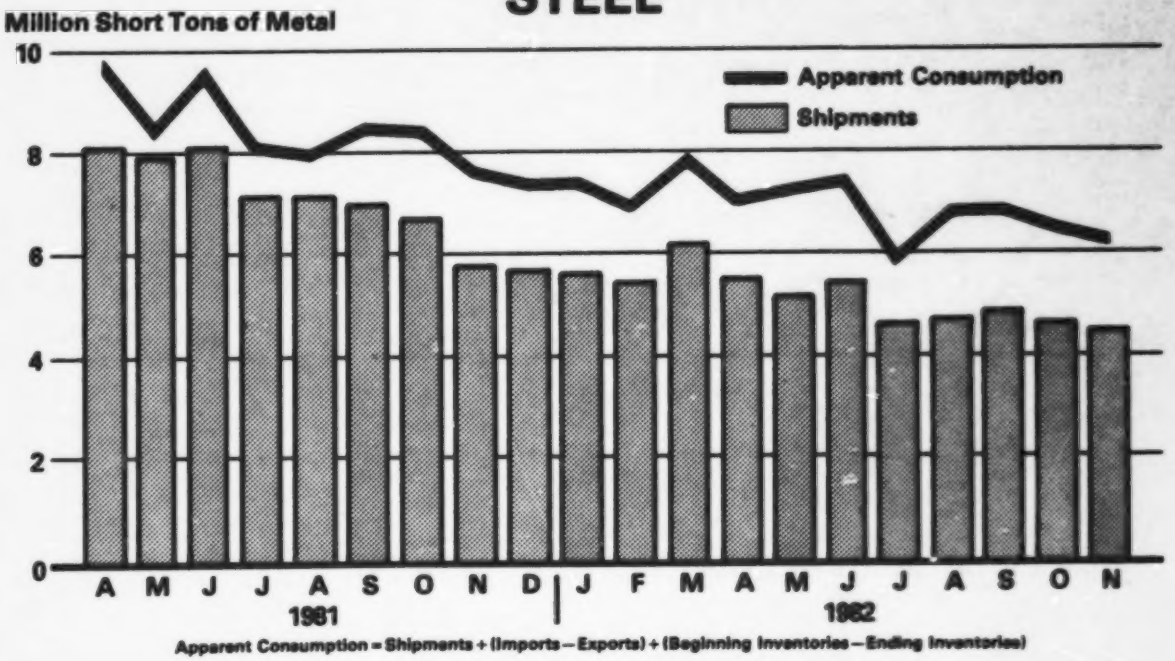
STEEL



Apparent Consumption = Shipments + (Imports – Exports) + (Beginning Inventories – Ending Inventories)

YEAR OR MONTH	PRODUCTION OF RAW STEEL[2]	STEEL MILL PRODUCTS[1]					PRICE[3] ¢/S.T.
		APPARENT CONSUMPTION	SHIPMENTS[2]	IMPORTS[3]	EXPORTS[3]	PRIVATE INVENTORIES[4]	
1978	137.0	113.4	97.9	21.1	2.4	37.2	360
1979	136.3	115.1	100.3	17.5	2.8	37.1	400
1980	111.8	101.5	83.9	15.5	4.1	30.9	434
1981	119.9	102.5	87.0	19.9	2.9	30.0[5]	484
1981:							
JAN	10.6	8.8	7.6	1.3	0.3	30.7	468
FEB	10.0	8.3	7.4	1.2	0.2	30.8	468
MAR	11.7	8.9	8.4	1.1	0.3	31.1	472
APR	11.2	9.9	8.1	1.8	0.3	30.8	476
MAY	11.4	8.4	7.9	1.8	0.3	31.8	476
JUNE	10.5	9.6	8.1	1.7	0.3	31.7	476
JULY	10.2	8.1	7.1	1.7	0.2	31.6	480
AUG	10.1	8.0	7.1	2.2	0.2	32.7	480
SEP	9.6	8.5	7.0	1.7	0.2	30.5[6]	500
OCT	9.0	8.4	6.7	1.9	0.2	30.5	504
NOV	8.0	7.6	5.8	1.9	0.2	30.4	504
DEC	7.7	7.4	5.7	1.6	0.2	30.0	504
1982:							
JAN	7.7	7.4	5.6	2.0	0.2	30.0	504
FEB	7.2	6.9	5.4	1.6	0.2	29.9	504
MAR	8.0	7.9	6.2	1.4	0.2	29.4	504
APR	7.0	7.0	5.5	1.0	0.1	28.8	506
MAY	6.7	7.3	5.1	1.7	0.2	28.1	506
JUNE	6.0	7.5	5.4	1.1	0.2	26.9	506
JULY	5.7	5.9	4.5	1.1	0.1	26.5	506
AUG	5.5	6.8	4.7	1.6	0.2	25.8	506
SEP	5.3	6.8	4.8	1.2	0.2	24.8[6]	506
OCT[6]	5.3	6.5	4.8	1.2	0.1	24.0	506
NOV[6]	4.9	6.3	4.4	1.2	0.2	23.1	506

See footnotes at end of section.
Data prepared November 24.

F. J. SCHOTTMAN (202) 634-1022

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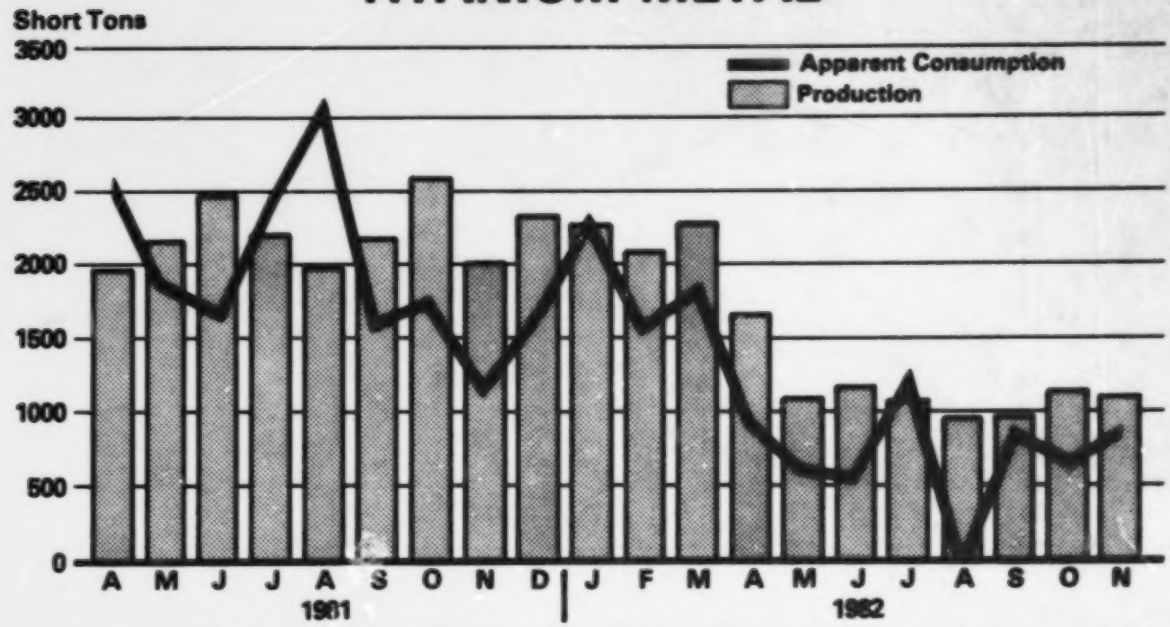
TITANIUM METAL



Apparent Consumption = Primary Production + Production from Old Scrap + (Imports-Exports) + (Beginning Inventories-Ending Inventories).

YEAR OR MONTH	APPARENT CONSUMPTION	PRODUCTION		IMPORTS	EXPORTS	INVENTORIES		PRICE ¢/LB.[2]
		PRIMARY[1]	FROM OLD SCRAP			PRIVATE	GOVERNMENT	
1978	17,922	17,571	250	6,951	7,789	11,317	32,331	3.08
1979	22,561	21,142	250	9,908	8,602	11,454	32,331	3.86
1980	22,619	22,505	300	10,052	8,800	12,892	32,331	5.50
1981[p]	23,891[r]	26,506[r]	300	11,639	9,643	17,803	32,331	7.65
1981:								
JAN	1,499	2,423	25	735	752	13,824	32,331	7.22
FEB	2,580	2,162	25	1,104	920	13,605	32,331	7.22
MAR	1,845	2,397	25	983	1,008	14,157	32,331	7.22
APR	2,592	1,886	25	1,316	861	13,931	32,331	7.22
MAY	1,856	2,123	25	1,260	845	14,638	32,331	7.22
JUNE	1,701	2,461	25	738	799	15,362	32,331	7.65
JULY	2,443	2,149	25	1,007	644	15,456	32,331	7.65
AUG	3,121	1,949	25	1,822	712	15,419	32,331	7.65
SEP	1,610	2,129	25	892	636	16,219	32,331	7.65
OCT	1,742[e]	2,545[r]	25	503	696	16,852[e]	32,331	7.65
NOV	1,186[e]	2,002[e]	25	682	1,066	17,289[e]	32,331	7.65
DEC	1,706[e]	2,280[e]	25	597	662	17,803[e]	32,331	7.65
1982:								
JAN	2,319[e]	2,216[e]	25	510	636	17,599[e]	32,331	7.65
FEB	1,596[e]	2,052[e]	25	426	756	17,750[e]	32,331	7.65
MAR	1,845[e]	2,225[e]	25	406	744	17,817[e]	32,331	7.65
APR	951[e]	1,615[e]	25	329	1,000	17,835[e]	32,331	5.55
MAY	617[e]	1,046[e]	25	660	1,253	17,696[e]	32,331	5.55
JUNE	586[e]	1,123[e]	25	258	1,020	17,496[e]	32,331	5.55
JULY	1,243[e]	1,042[e]	25	291	353	17,248[e]	32,331	5.55
AUG	0	917[e]	25	289	663	17,926[e]	32,331	5.55
SEP	888[e]	934[e]	25	283	522	17,738[e]	32,331	5.55
OCT[e]	678	1,100	25	385	880	17,700	32,331	5.55
NOV[e]	880	1,040	25	400	805	17,880	32,331	5.55

See footnotes at end of section.
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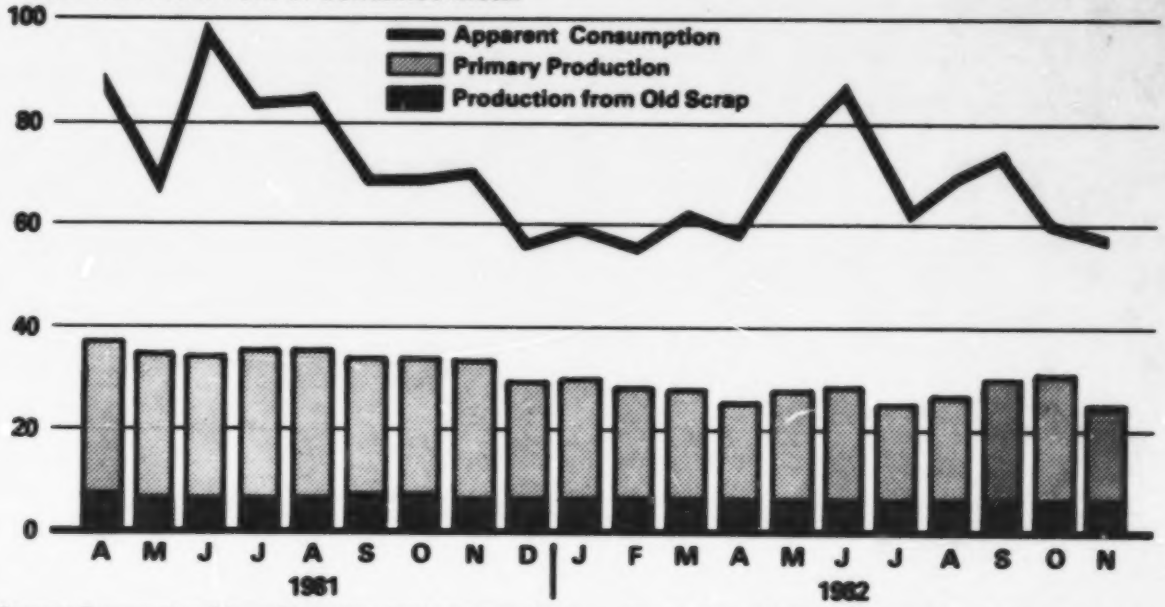
ZINC

Thousand Metric Tons of Contained Metal



Apparent Consumption = Primary Production + Production from Old Scrap + (Imports-Exports) + (Beginning Inventories-Ending Inventories).

YEAR OR MONTH	APPARENT CONSUMPTION	PRODUCTION		IMPORTS[3]	EXPORTS[4]	INVENTORIES		PRICE ¢/LB.[6]
		PRIMARY[1]	FROM OLD SCRAP[2]			PRIVATE	GOVERNMENT	
1978	1,163	441	77	630	18	137[5]	346	31.0
1979	1,092	526	81	529	29	152	346	37.3
1980	842	370	86	414	34	126	342	37.4
1981[p]	995	393	86	620	35	195	341	44.6
1981:								
JAN	71	30	6	37	3	118	342	41.2
FEB	88	29	6	52	1	116	342	41.3
MAR	93	31	6	49	3	106	342	41.3
APR	89	31	7	53	4	104	342	42.6
MAY	66	29	6	54	4	123	342	45.2
JUNE	99	28	6	72	7	123	341	46.1
JULY	83	30	6	56	3	129	341	46.2
AUG	85	30	6	52	2	130	341	47.5
SEP	89	27	7	43	2	136	341	48.7
OCT	89	27	7	48	2	147	341	45.9
NOV	71	27	6	65	2	172	341	46.1
DEC	57	23	6	34	1	177	341	42.6
1982:								
JAN	60	24	6	36	2	181	341	42.2
FEB	54	22	6	31	2	184	341	42.7
MAR	62	21	6	38	1	186	341	39.2
APR	59	19	6	27	3	176	341	35.5
MAY	78	21	6	36	1	160	341	34.7
JUNE	87	22	6	40	1	140	341	34.6
JULY	61	19	6	29	1	132	341	35.7
AUG	70	20	6	30	1	117	341	37.8
SEP	75	24	6	36	2	106	341	39.6
OCT[e]	80	25	6	29	2	105	341	40.8
NOV[e]	58	18	6	35	1	105	341	NA

See footnotes at end of section.

Data prepared November 24.

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GENERAL NOTES

Numbers in the mineral data series tables are from the Bureau of Mines, except for import and export series (Bureau of the Census) and government inventories (General Services Administration: semi-annual Stockpile Report to the Congress and monthly Inventory of Stockpile Materials), or as cited in the footnotes below.

Inventory figures are for the end of the period.

Monthly figures are independently rounded. They exclude year-end revisions and may not add to annual totals.

Long ton unit (LTU), short ton unit (STU): In sales of ores, concentrates or metals, a unit is 1% of the specified substance. A ton of 1% ore contains 1 unit. A ton of 48% manganese contains 48 units.

Abbreviations Used

Long ton (l.t.) = 2,240 pounds Metric ton (m.t.) = 2,204.6 pounds, 1,000 kilograms Short ton (s.t.) = 2,000 pounds

Footnotes Used

e/ = Estimate p/ = Preliminary r/ = Revised NA = Not available

FOOTNOTES, BY COMMODITY

ALUMINUM

1/ Reported by Department of Commerce.
2/ Primary aluminum. Annual figures are Bureau of Mines averages. Monthly figures are end-of-month producers' list prices. The market or spot price in September and October quoted by Metals Week was 43.4 and 45.0 cents/lb., respectively.

N.B. Data are for aluminum metal only. Nonmetallic uses of bauxite and alumina in chemical, abrasive and refractory materials represent, on an aluminum basis, about 10 percent of domestic consumption.

CHROMIUM

1/ In alloys, by metallurgical industry, and in chromite, by refractory and chemical industries. Estimates do not include yield losses in production or make adjustments for an incomplete survey of industry.
2/ Estimated chromium content of stainless steel scrap received by steel industry.
3/ Chromium content of chromite and chromium alloys.
4/ Producer and consumer inventories of alloys and metal and consumer inventories of ores.
5/ Ore f.o.b. Turkey.

COBALT

1/ Reported consumption of purchased scrap.
2/ Content of unwrought cobalt, cobalt alloys, and waste and scrap.
3/ End-of-month stocks at processor and consumer establishments only for monthly data.
4/ Weighted average based on market price quoted by major cobalt dealer in the United States.
5/ Estimated as consigned to the stockpile based on import data.
6/ Recent imports which were intended for the national stockpile and had not yet been officially recorded as accepted for the stockpile.

COPPER

1/ Refined metal and metal used in production of alloys, from domestic and foreign ores, and old scrap.
2/ Unwrought refined copper and scrap.
3/ Refined copper held at primary producers' plants, wire mills, brass mills, and in Commodity Exchange, Inc. warehouses.
4/ Average of the daily quotes for domestic producers' delivered wirebar.

IRON ORE

1/ All data estimated except for annual mine production.
2/ Based on gross weights reported by American Iron Ore Association.
3/ Calculated from data reported to Bureau of Mines by U.S. producers.
4/ Includes usable ore reported at U.S. mines, docks, and consuming plants.
5/ Based on published end-of-month price for Lake Superior iron ore pellets, delivered rail-of-vessel at lower Great Lakes ports, per long ton unit of iron, natural basis.

LEAD

1/ Monthly canvass adjusted to reflect annual canvass and exclude approximately 15 percent new scrap.

MANGANESE

1/ Includes manganese contained in manganiferous ore as well as in manganese oil, if any.
2/ Producer and consumer inventories of alloys and metal and consumer inventories of ores.
3/ Average price per long ton unit, metallurgical ore containing 46 to 48 percent manganese.
4/ Reflects inventory adjustments.

NICKEL

1/ Contained nickel in ferronickel.
2/ Includes new and old scrap.
3/ Exports of unwrought nickel, powder, flakes, and electrolytic anodes.
4/ Includes estimated producer and producer's agent stocks in the United States.
5/ Producer listed price of cathode nickel.
6/ Calculated excluding producer inventories.

PLATINUM-GROUP METALS

1/ Refined metal.
2/ Non-tolled scrap. Breakdown between old and new scrap not available.
3/ Refined metal and scrap metal.
4/ Refined metal held by refiners, importers, dealers, and includes platinum and palladium in New York Mercantile Exchange warehouses.
5/ Quarterly and annual averages of weekly major-producer prices.

STEEL

1/ Net including iron and steel foundry products.
2/ Reported by the American Iron and Steel Institute (AISI).
3/ Data compiled by AISI from reports of the Bureau of the Census.
4/ Steel mill shapes and forms held by producing mills, service centers, and consuming manufacturers, reported by Bureau of the Census.
5/ Average composite price of finished steel.
6/ Revised series beginning in September.

TITANIUM METAL

1/ Calculated sponge metal production = sponge consumption - sponge imports + exports and adjustments for government and industry stock changes.
2/ Monthly figures are end-of-month quotes for sponge.

ZINC

1/ Monthly production figures reported by the American Bureau of Metal Statistics, Inc. (ABMS) do not include all data from companies reporting annually to the Bureau of Mines.
2/ Monthly old scrap figures based on a percentage of the total secondary zinc produced during the month.
3/ Imports for consumption of slab zinc, fume, dross, and skimming.
4/ Consists of unwrought zinc, zinc content of waste, and scrap and dross.
5/ Does not include merchant stocks.
6/ Quoted at New York, delivered basis.

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